

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight and The Aircraft Engineer.

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## EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."—  
(Sir Auckland Geddes, Minister of National Service.)



ALTHOUGH we do not hear a great deal of the work of the seaplane service nowadays—at least in comparison with that of our aircraft on the fighting front—it is nevertheless one of the hardest worked and withal most useful branches of the air service. Flying far out to sea for the protection of convoys bringing food to these shores and conveying troops to their ports of debarkation; attending on the hunting flotillas engaged in holding down the enemy's submarine activities; and performing generally the duties of handmaiden to the Fleet, the seaplane squadrons based on our coast ports are doing magnificent work. It is not spectacular work, nor is it even exciting for the most part. It is but seldom the joy of battle enters into it. Only on those rare occasions, such as we had an example of last week, when a patrolling flight met certain enemy seaplanes off the Dutch coast to the marked discomfi-

ture of the Hun, or when the single machine, hovering over the waters of the Channel or the North Sea sights the dim silhouette of a submerged U-boat, is there any variety to the deadly monotony of patrol flying. But if it is monotonous and without the thrills of flying over the battle lines of France, it is nevertheless attended by dangers that are sufficient to raise the hair of the ordinary stay-at-home citizen. The adventurous pilot, flying "on his own" or perhaps in company with another, over the dreary, mine-strewn wastes of the North Sea may meet with mishaps which, while they would be of small account in the case of the pilot whose flying is done over the land, may well mean that his name will presently figure in the list of those "Missing, believed drowned." All prosaic and unthrilling as the work may seem to the layman, the gallant men who man our seaplane patrols literally take their lives in their hands every time they fly out over the face of the waters. A slight engine derangement when far from the land and with no surface craft within call may make all the difference between safe return to the base and a lonely death. How many of our keen young pilots have added their names to the Roll of Honour while on this service which the developments of modern sea war have made essential to the preservation of our sea-power, we have no means of knowing. Possibly we shall never know, but the toll has been a heavy one, and must grow as the war goes on and the war in the air develops. But although the service is dangerous, and although it is without the spectacular characteristics of aerial war over the land, there is no lack of the right men for the job, and so the service goes on as all our fighting services have a way of doing. And even though there is no limelight about it, we should not forget in the press of other and more public interests, so to say, what our seaplane service is doing towards the defeat of the Hun, nor the price it is paying.

### Air Raid Insurance Claims.

In the House of Commons last week, Sir H. Nield put certain questions to the President of the Board of Trade relative to the relations between the Government anti-aircraft insurance department and the insured. The questions and the answers thereto we print on another page of this issue of FLIGHT. The main question was really one of alleged bad

faith in a specific case, but other issues of a general tendency towards undue harshness in the adjustment of claims were raised.

We cannot say that the reply of the President of the Board of Trade was one to carry complete conviction. So far as the case which formed the main subject of the question is concerned, the explanation given may be accepted, but we confess we do not think that the whole matter is disposed of by the general terms of the answer. It is easy enough to explain that people claim under their policies for damage which has not been caused by aircraft or anti-aircraft gun-fire, but we are a long way from satisfied that the Government assessors are always reasonable in their views of what does or does not fall legitimately under the head of insurable damage. To our way of thinking, seeing that the matter is one of State responsibility to the assured, it would be far better to err on the side of generosity in the interpretation of claims than to go to the other extreme. Unfortunately, experience goes to show that that attitude adopted tends toward the latter. It would be absolutely calamitous were the Government to acquire a reputation for "doing" those who stand in the relation of clients to the State. The last thing in the world that the Government can afford is to have colourable charges of bad faith levelled against its relations between itself as an insurance institution and those who have been led to insure their risks with it. That is a fundamental fact which is well recognised and applied to practice by the private insurance corporations and which applies with far more force to the Government than to them.

There is another aspect of the matter which we dislike, and that is the implication—which was not disposed of by Sir Albert Stanley—that the representatives of the Government are inclined to take cases into Court, relying on the rule that costs cannot be given against the Crown. If there is anything in the charge, and it must be presumed there is, it seems to us that the sooner very definite instructions are given to those concerned that the courts are only to be used as a very last resource the better. However, this is only a part of the general charges which imply a tendency to sharp practice on the part of some of the Government assessors. It is very much to be hoped that the case quoted by Sir Herbert Nield in his question is an exceptional one, no matter on which side the merits may lie, and we may leave it at that.

\* \* \*

#### The Supreme War Council and the Crisis.

In the middle of last week the Press Bureau issued to the Press a *communiqué* which, while it made no attempt to minimise the gravity of the present situation on the Western Front, was a decided improvement on the usual literary efforts of the official source of "news." It was, at the same time as it pointed out the certainty of still further anxious days to come, reassuring, in a dignified way, of the ultimate issues of the war. The *communiqué* dealt with the proceedings of the Supreme War Council at Versailles, and while it obviously could not disclose the data upon which the Council bases its convictions, it did set forth the main conclusions at which that body has arrived.

"After a review of the whole position," it says, "the Supreme War Council is convinced that the Allies, bearing the trials of the forthcoming campaign

with the same fortitude which they have ever exhibited in the defence of right, will baffle the enemy's purpose, and in due course will bring him to defeat.

"Everything possible is being done to sustain and support the armies in the field. Arrangements for unity of command have greatly improved the position of the Allied armies, and are working smoothly and with success.

"The Supreme War Council has complete confidence in General Foch; it regards with pride and admiration the valour of the Allied troops.

"Thanks to the prompt and cordial co-operation of the President of the United States, arrangements which were set on foot more than two months ago for the transportation and brigading of American troops will make it impossible for the enemy to gain a victory by wearing out the Allied reserve before he has exhausted his own.

"The Supreme War Council are confident of the ultimate result. The Allied peoples are resolute not to sacrifice a single one of the free nations of the world to the despotism of Berlin. Their armies are displaying the same steadfast courage which has enabled them on many previous occasions to defeat the German onset.

"They have only to endure with faith and patience to the end to make the victory of freedom secure. The free peoples and their magnificent soldiers will save civilisation."

We could find it in our heart to wish that more of these antidotes to pessimism had been given to the Allied peoples, for we like the tone of this. Confidence in the justice of our cause; faith in the Allied command; and reliance on the valour of our soldiers and the constancy of our people seem to stand out of every line, and when the Supreme War Council thus manifests its faith in the issues, defeatism—even pessimism—cannot lift its head. For our part, we have never had anything but belief in the final victory of the Allies. Vicissitudes there have been and will be in the future. There has been bungling and mismanagement, and a frittering away of our resources in all sorts of side-shows and issues remote from the main business of beating the Hun, but while we have deplored the spectacle of incompetence which these things have laid bare to view we have never thought that the war could have any other ending than that of complete victory for the Allies. The campaigns of the coming summer will carry many anxious days for us. We are fighting a ruthlessly efficient enemy, who has made war his special study, and we are compelled to fight him with armies which, with no disparagement to the gallant men who compose them, are but amateurs by comparison. Nothing that has happened in the war is more illustrative of that fact than the recent German offensive on the Marne and the Oise. While we hate the Hun, as all good Britons should, it is impossible not to admire the wonderful manner in which the German staff carried out a series of operations of the most difficult nature, and carried them out successfully up to the point at which the Allied reserves entered into the fight to stay the enemy's advance. In particular, the staff work—in which we are notoriously weak—must have been simply magnificent. It could only have been done by officers who were artists at their work. But in spite of the handicaps, we are assured that if only the Allied peoples "stick it" the war can have but one ending. The enemy is using up his



reserves at an appalling rate in the endeavour to force a decision before the American armies can really get going—but he is at least three months too late, even assuming that he could have beaten the Allies if America had not come into the war at all. But America *is* in the war, and to some purpose. We wish it were possible to give the figures relating to the transport of American troops to France, but while they would cause a wave of renewed confidence to pass over the Allied peoples they would also give

the enemy information he would give a lot to possess. They are, however—and there can be no harm in saying it—far and away greater than we could have hoped a few months ago, as the enemy will find before he goes much farther. We have but to “endure with faith and patience to the end,” and all will be well. How far off that end may be we do not know, but whether it come this year or next or later even than that, we believe that our peoples will so endure.

**The King and the R.A.F.**

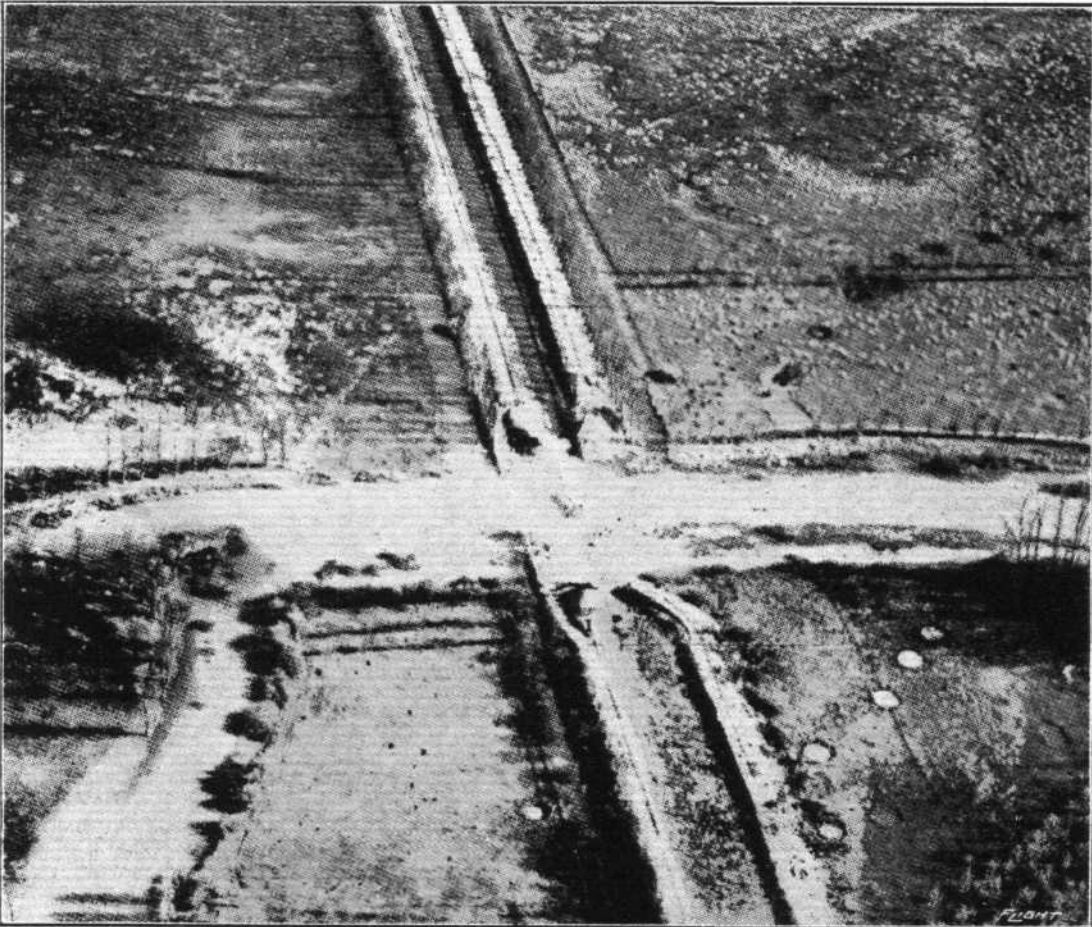
It was announced in the *Court Circular*, dated Royal Pavilion, Aldershot Camp, June 7th, that the King and Queen and Field-Marshal the Duke of Connaught, attended by the Ladies and Gentlemen-in-Waiting, inspected establishments of the Royal Air Force.

**Prohibited Imports.**

A PROCLAMATION in the *London Gazette* of June 4th prohibits the importation into the United Kingdom, except by Board of Trade licence, of the following articles:—  
Motor spirit (including aviation spirit), kerosene (including white spirit), gas oil, fuel oil and distillates from which any of the preceding can be produced.  
Treadle lathes of 3 in. centres and over.

**Women in the R.A.F.**

AN Order in Council has been made to amend the Air Force Act so that the provisions of the Army Act as to billeting shall apply to women who are enrolled for employment by the Air Council as they apply to men. Officers of any body of the Air Force with whom the women to be billeted are employed, and the officer commanding that body, are to “be deemed in relation to such women to be their officers and commanding officer; and if any such woman is guilty of an offence in relation to billeting” mentioned in Section 30 of the Army Act, she shall be punishable on summary conviction. [Section 30 of the Army Act makes it an offence for any person subject to military law to be guilty of any ill-treatment of the occupier of a house in which any person or horse is billeted.



The Oise-Aisne Canal, blown up by the French.  
—Photographed by a German airman.

**PAPER-RATIONING.**

**WARNING TO READERS.**—As has been foreshadowed for some time, greater official restrictions upon the sale of papers have become necessary, and after June 24th newspapers will not be permitted to be distributed under the scheme known as “Sale or Return.” This means that those readers who wish to receive “FLIGHT” regularly, must place a definite order with their bookstall or newsagent for a copy to be reserved, or, as the only alternative, send an order to the Publishing Office, 36, Great Queen Street, Kingsway, W.C. 2, for “FLIGHT” to be sent each week by post. The direct subscription, by P.O.O. or Cheque, is as follows:—

	3 months.	6 months.	12 months.
	s. d.	s. d.	s. d.
United Kingdom ..	7 1	14 1	28 2
Abroad ..	8 3	16 6	33 0

The above is imperative as from June 24th if you wish to get “FLIGHT” each week.

## HONOURS.

### Honour for Sir Godfrey Paine.

It was announced by the Admiralty on June 5th that a Good Service Pension of £150 a year had been awarded to Capt. Sir Godfrey M. Paine, K.C.B., M.V.O., R.N. (temporary Major-General in the Royal Air Force) for some time Commandant of the Central Flying School. Dated April 27th, 1918.

### Honours for the R.N.A.S.

It was announced in the *London Gazette* on June 7th that the King has been pleased to approve of the award of the following decorations and medal to officers and men of the R.N.A.S. :—

#### *Distinguished Service Cross.*

Flight-Lieut. John Gamon, R.N.A.S.—For conspicuous gallantry and devotion to duty. On March 30th, 1918, whilst returning from a bombing raid, he was attacked by three enemy triplanes, one of which he brought down and drove off the other two. He has carried out very many bombing raids on enemy lines of communication, aerodromes and dumps. His work has always been of the greatest merit, and he has set a splendid example to those around him.

Flight Sub-Lieut. G. B. S. McBain, R.N.A.S.—For conspicuous bravery and devotion to duty in carrying out bombing raids on enemy troops, aerodromes and lines of communication. On March 18th, while returning from bombing an enemy aerodrome, he was attacked by five enemy scouts. After a short combat one of the scouts was seen to nose-dive, and its tail plane fell off. The four other enemy aircraft retired. He has carried out many bombing raids, at all times showing great determination and setting a splendid example.

#### *Bar to the D.S.C.*

Flight-Lieut. (Acting Flight-Comdr.) L. H. Rochford, D.S.C., R.N.A.S.—For consistent determination, bravery and skill. As a flight-commander he has shown considerable ability, and has always set a fine example when dealing with enemy aircraft. On March 21st, when on offensive patrol, he attacked one of nine Albatros scouts. Enemy aircraft was seen to go down in the mist out of control. He has destroyed or driven down out of control many other enemy machines.

Flight-Lieut. (Acting Flight-Comdr.) C. R. Lupton, D.S.C., R.N.A.S.—For conspicuous bravery and skill in leading bombing formations, especially on March 26th, when he carried out at low altitudes four bombing raids on enemy communications. In the course of these raids he caused great damage to enemy transport, and inflicted serious casualties on large numbers of their reinforcements. He has carried out very many bombing raids, and by his courage and resource has instilled a spirit of confidence and daring in all those who have flown with him.

Flight-Lieut. J. A. Glen, D.S.C., R.N.A.S.—For exceptional gallantry and skill as a flight leader when engaging enemy aircraft. He has destroyed or driven down out of control many enemy machines.

#### *Bar to the D.S.M.*

Air-Mech., 1st Grade, W. Naylor, D.S.M., O.N. F1406.

The following officer has been mentioned in despatches :—  
Flight-Lieut. H. C. Lemon, R.N.A.S. (killed).

The following decoration has been conferred by the King of the Hellenes for distinguished services rendered during the war :—

#### ORDER OF THE REDEEMER.

##### *Fourth Class.*

Wing-Comdr. (Acting Wing Capt.) E. Gordon, D.S.O., R.N.A.S. (Major and Temp. Lieut.-Col., R.M.L.I.).

#### *Correction.*

In *Gazette* of May 1st, page, 5281, col. 2, for Flight-Lieut.

Charles Henry Fitzherbert, R.N.A.S., read Flight-Lieut. Cecil Henry Fitzherbert, R.N.A.S.

### M.Ms. for Brave Nurses.

It was announced in a supplement to the *London Gazette* on June 4th that the King has been pleased to approve of the award of the Military Medal to the following ladies for distinguished services in the Field as recorded :—

Sister-in-charge KATE MAXEY, T.F.N.S.—For gallantry and conspicuous devotion to duty displayed during a recent hostile bombing raid on a Casualty Clearing Station. Although severely wounded herself, she went to the aid of another sister, who was fatally wounded, and did all she could for her. Later, although suffering severe pain, she showed an example of pluck and endurance which was inspiring to all.

Sister DOROTHY PENROSE FOSTER, R.R.C., T.F.N.S.—For conspicuous coolness and devotion to duty when supervising the transfer of patients from a Casualty Clearing Station to an ambulance train while the locality of the Casualty Clearing Station was being steadily shelled. She set a splendid example of calmness and composure.

Acting Sister MARY AGATHA BROWN, Q.A.I.M.N.S. (R.).—For bravery and devotion to duty during a hostile bombing raid when in company with the Matron, who was severely wounded, and a sister, who was killed. She remained with them and tended them till help arrived. Subsequently she returned to the Casualty Clearing Station and worked devotedly for many hours, under conditions of great danger.

Acting Sister MARIE DOW LUTWICK, Q.A.I.M.N.S. (R.) (Can.).—For bravery and devotion to duty during a hostile bombing raid when in company with the Matron, who was severely wounded, and a sister who was killed. She crossed the open bomb-swept ground alone in order to procure help. Subsequently she returned to the Casualty Clearing Station and continued to work for many hours under conditions of great danger.

Miss LILIAN AUDREY FORSE, V.A.D.—For courage and devotion to duty displayed when during a hostile air raid a bomb fell on the hospital marquee of which she was in charge. Although great damage was done and many patients injured, she showed admirable coolness in the performance of her duties throughout, and carried on as if nothing had happened.

### Honours for Work in Egypt.

It was announced in a supplement to the *London Gazette* that the King has been pleased, on the occasion of His Majesty's birthday, to approve of the following rewards for distinguished service in connection with the operations in Egypt :—

To be Brevet Lieut.-Col. on promotion to Major.

Capt. (T./Col.) A. E. Borton, D.S.O., R. Highdrs. and R.F.C.

#### *Meritorious Service Medal.*

2481 T./R.S.M., W. Lambert, Essex R., att'd. R.A.F.

### An Albert Medal for the R.F.C.

THE King has awarded the Albert Medal to Sergt. (Flight-Sergt.) Thomas Nicholl, R.F.C., in recognition of an act of gallantry which he performed in France on February 26th, 1918 :—

Two bombs exploded under an aeroplane, burning the machine entirely and causing considerable loss of life. Owing to the explosion a phosphorus bomb attached to another machine standing near to it was ignited. Flight-Sergt. Nicholl, with great presence of mind, and regardless of the danger to himself, unhooked the burning bomb and carried it to a place of safety. By his prompt action Flight-Sergt. Nicholl, whose hands were badly burned, saved the second machine and prevented further serious damage and loss of life which would probably have been caused.



### A Four-Engined Gotha.

It was announced by the Press Bureau last week that a giant German aeroplane brought down in France recently had the following characteristics :—

Four engines ; span, 136 ft. ; length over all, 66 ft. 6 ins. ; crew, number not definitely known.

The correspondent of the Havas Agency on the French Front telegraphs that the giant German aeroplane which was brought down on June 1st in the neighbourhood of Retz (south-west of Soissons) carried nine passengers, including the pilot officer commanding, two observer officers and machine-

gunners, two specialist engineers, a second pilot in charge of the engines, and two other specialist engineers.

The machine is of the most recent type of giant aeroplanes. Its principal characteristics are as follows : Four motor engines, each of 300 h.p. ; spread of wings, 43 m. (about 141 ft.) ; total length, 28 m. (about 92 ft.) ; crew, nine men ; weight (when empty), 9,200 kilogs (over 9 tons) ; weight in flight, when fully loaded, 14,600 kilogs. (14½ tons) ; weight of bombs that can be carried, about 2,000 kilogs. (about 2 tons) ; maximum speed, 120 to 130 kiloms. (75 to 80 miles) per hour ; armament, four machine guns.



## BIRTHDAY HONOURS FOR WAR WORKERS.

THE King has been pleased on the occasion of His Majesty's Birthday, to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire, dated June 3rd, for services in connection with the war. The biographical notes in each case have been supplied officially:—

### *Knights Commanders (K.B.E.)*

Horace Darwin, Esq., F.R.S., Chairman, Cambridge Scientific Instrument Co., Ltd., Member of Munitions Inventions Department Panel.  
Lieut.-Col. Albert George Hadcock, T.D., F.R.S., Managing Director, Sir W. G. Armstrong, Whitworth and Co., Ltd.

### *Commanders (C.B.E.)*

Brig.-Gen. Albert Fletcher, M.C., Director of Air Quartermaster Services, Air Ministry.  
Brig.-Gen. Francis Conway Jenkins, Director of Parks and Depôts, Air Ministry.  
Acting Paymaster-in-Chief Frank Lenn, R.N., in charge of Central Pay Office, R.N.A.S.  
William Malesbury Letts, Managing Director, Messrs. Crossley Motors, Ltd.  
Col. John Dolben Mackworth, Deputy Director of Balloons, Air Ministry.  
Frederick Handley Page, Esq., Managing Director, Messrs. Handley Page, Ltd.  
Henry White Smith, Esq., Director and Secretary, British and Colonial Aeroplane Co., Ltd.; Chairman, Society of British Aircraft Constructors.

### *Officers (O.B.E.)*

Major the Hon. Maurice Baring, Staff Officer, 2nd Class, R.A.F.  
Capt. Frank Sowter Barnwell, Aeroplane Designer, British and Colonial Aeroplane Co., Ltd.  
Lieut.-Col. Bernard John Wolfe Barry, Staff Officer 1st Class, R.A.F.  
Major Basil Benyon, R.A.F.  
Major James Bird, R.A.F.  
Granville Eastwood Bradshaw, Esq., Messrs. Walton, Motors, Ltd.  
Lieut.-Col. Robert Harvey Brand, Assistant Controller of Supplies in Directorate of Aircraft Equipment, R.A.F.  
Reginald Ormsby Cary, Esq., Director and General Manager, Sopwith Aviation Co., Ltd.  
Lieut.-Col. John Adrian Chamier, D.S.O., Officer Commanding School of Instruction, R.A.F.  
William John Cruddas, Esq., Section Director, Aircraft Production Department, Ministry of Munitions.  
Lieut.-Col. James William Ogilvy-Dalgleish, Asst. in the Directorate of Air Personal Services, Air Ministry.  
Col. Thomas Edward St. Clare Daniell, M.C., Deputy Director of Aircraft Equipment, R.A.F.  
Col. Edward Humphrey Davidson, M.C., Deputy Director of Air Intelligence, R.A.F.  
Capt. Ernest Andrew Ewart, Propaganda Branch, Aircraft Production Department.

William Henry Fiske, Esq., Managing Director, Messrs. Boulton and Paul, Ltd.  
Allen Edward Ford, Esq., Section Director, Aircraft Finance Department, Ministry of Munitions.  
Herbert Glaser, Esq., Section Director Aircraft Production Department, Ministry of Munitions.  
Lieut.-Col. Harcourt Gilbey Gold, Staff Officer, 1st Class, R.A.F.  
Capt. Geoffrey de Havilland, Aeroplane Designer, Aircraft Manufacturing Co.  
Lieut.-Col. Francis Esme Theodore Hewlett, R.A.F. and Directorate of Aircraft Production.  
Miss Hilda Phoebe Hudson, D.Sc., Aerodynamics Technical Research, Aircraft Production Department, Ministry of Munitions.  
Lieut.-Col. John Charters Kirk, Anti-Aircraft Defences, Home Forces.  
Major Solomon James Lacey, R.A.F., Barrack-master, Seaplane Station.  
Frederick Osborne Simeon Leake, Esq., Chairman, Messrs. A. V. Roe and Co., Ltd.  
Lieut.-Col. Henry Edith Arthur Lindsay, Staff Officer, 1st Class, R.A.F.  
Lieut.-Col. Charles Lloyd, J.D., Anti-Aircraft Defences, Home Forces.  
Major Michael John Long, Anti-Aircraft Defences, Home Forces.  
James Macartney, Esq., Chairman Aircraft Fabric Committee, and member Irish Sub-Committee Flax Control Board.  
Arthur John McCormack, Esq., Managing Director, Messrs. Wolseley Motors, Ltd.  
Lieut.-Col. Tom Darke Mackie, R.A.F., Air Service Constructional Corps.  
Lieut.-Col. Thomas Anthony Monckton, Technical Officer, R.A.F.  
Lieut.-Col. Alfred Drummond Warrington Morris, Staff Officer, 1st Class, R.A.F.  
Lieut.-Col. Edward Raymond Peal, D.S.C., Directorate of Aircraft Production, R.A.F.  
Thomas Charles Pullinger, Esq., Managing Director, Messrs. Arrol-Johnstone, Ltd.  
Lieut.-Col. Alexander Emil Jacques Reiss, R.A.F., Assistant Controller, Materials Branch, Aircraft Production Directorate.  
Lieut.-Col. Francis Maude Roxby, R.A.F.  
Samuel Edgar Saunders, Esq., Managing Director, Messrs. S. E. Saunders, Ltd.  
Lieut.-Col. Cyril Ambrose Shore, Staff Officer, 1st Class, R.A.F.  
James Moloney Spaight, Esq., LL.D., Acting Principal Clerk, Air Ministry.  
Lieut.-Col. Ralph Harold Austin-Sparks, Staff Officer 1st Class, R.A.F.  
Charles Robert John Atkin Swan, Esq., M.B., B.Ch., Admin. Med. Officer, R.A.F. Hosps.  
Arthur Wormald, Esq., Works Manager, Messrs. Rolls-Royce, Ltd.

## THE ROYAL AERO CLUB OF THE U.K.

### OFFICIAL NOTICES TO MEMBERS.

#### THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916).

#### Honorary Treasurer:

The Right Hon. LORD KINNAIRD.

#### Committee:

Brig.-Gen. W. W. WARNER, R.A.F. (Chairman).  
Mr. CHESTER FOX.  
Lieut.-Col. HARCOURT G. GOLD, R.A.F.  
Major T. O'B. HUBBARD, M.C., R.A.F.  
Squad.-Com. C. E. MAUDE, R.N.

#### Secretary:

Lieut.-Com. H. E. PERRIN, R.N.V.R.

#### Bankers:

Messrs. BARCLAY'S BANK, LTD., 4, Pall Mall East, London, S.W. 1.

#### Objects:

The Lords Commissioners of the Admiralty and the Army Council having signified their approval, THE ROYAL AERO CLUB has instituted and is administering this Fund for the benefit of Officers, Non-Commissioned Officers and Men of the Royal Air Forces who are incapacitated on active service, and for the widows and dependants of those who are killed.

#### Subscriptions.

	£	s.	d.
Total subscriptions received to June 4th, 1918	12,755	8	8
Collected at the Procter-Isaac Aviation Co. ..		2	6
Mr. E. W. Phillips, per Capt. Beddard ..		2	0

Total, June 11th, 1918.. .. 12,759 14 11

Offices: THE ROYAL AERO CLUB,  
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

# THE A.E.G. BOMBER, G. 105.

[Issued by the Technical Dept. (Aircraft Production), Ministry of Munitions.]

(Concluded from page 616.)

## Tail Planes.

THE fixed horizontal tail planes are notable for their extremely bold curvature, both top and bottom. The framework consists entirely of welded steel tubing. The leading edge of the tail plane is mounted so as to be adjustable in case of necessity, a simple bracket being used for this purpose, as illustrated in Fig. 20. This is welded on to the fuselage upright at each side and strengthened with a transverse stay. It allows the tail plane leading edge to be fixed in one

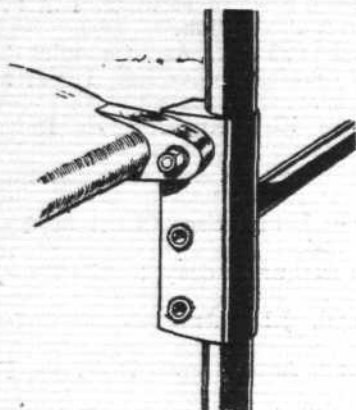


Fig. 20.

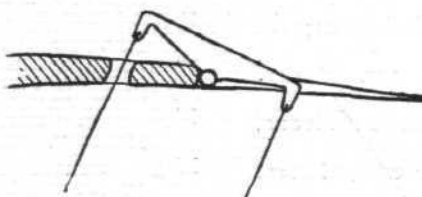


Fig. 21.

applied to the top plane only and have a chord which reaches its maximum at their extreme ends and its minimum in the centre of their length. For what purpose this peculiar shape is adopted is not clear. The framework of these *aileron*s is welded steel tubing, and the control crank is fitted in such a way as to lie partially hidden in a slot in the main plane. This crank is built up of welded sheet steel, and is arranged as shown in the sketch, Fig. 21, an elliptical hole being cut in the trailing edge of the main plane for the passage of the forward wire.

## Control.

The main control consists of a wheel mounted on a pivoted lever, the wheel operating the *aileron*s by means of a drum

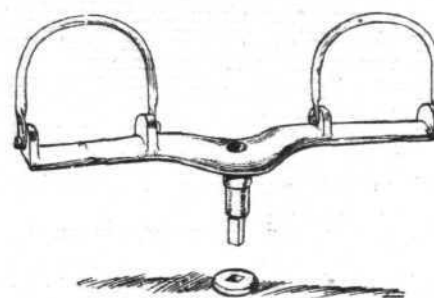


Fig. 22.

of three positions. The trailing edge of the tail plane is supported each side by a streamline section steel tubular strut.

## Fin.

The fin, like the fixed tail plane, has also a very strongly marked streamline section at the base tapering off to flat at the top, where it abuts against the balanced portion of the rudder. At this point its framework, which is of light steel tube, is made rigid by a couple of tubular stays bracing the rudder post to the sides of the fuselage.

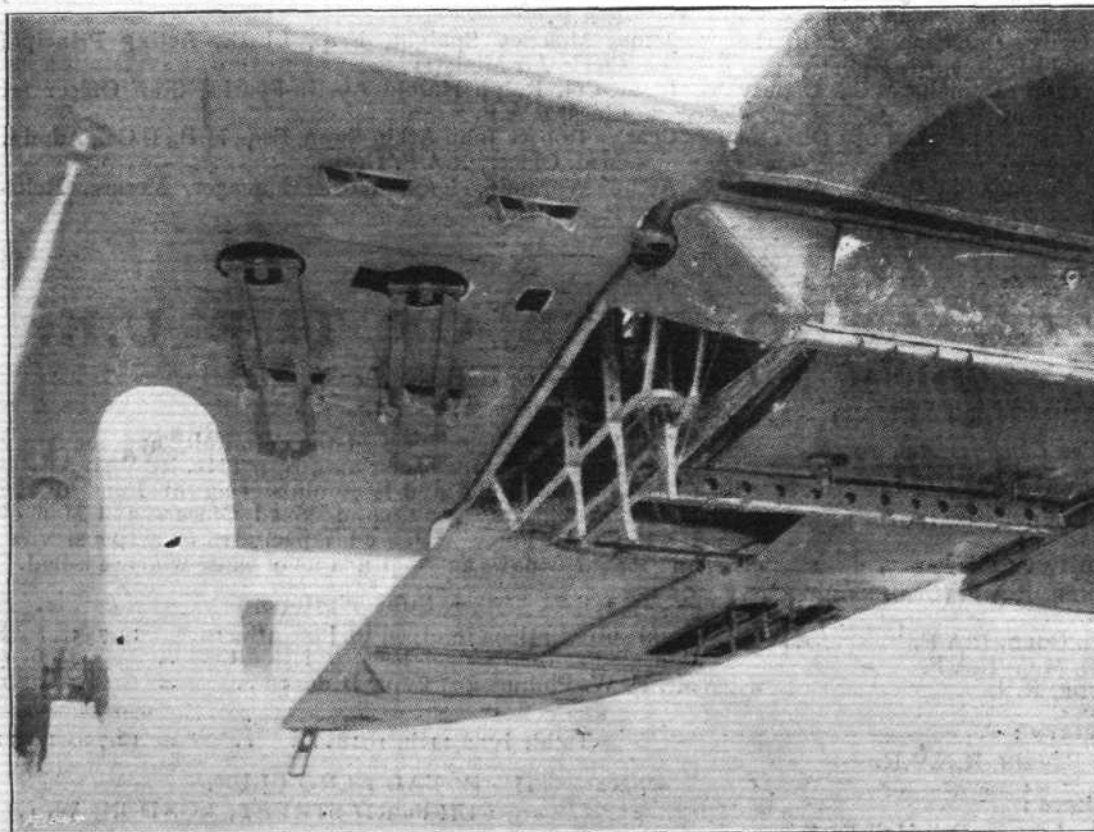
## Rudder and Elevators.

These organs are built up of steel tubular framework, and present no points of special interest, except that in the case of the rudder that part which is above the fixed fin is made of grooved section.

## Ailerons.

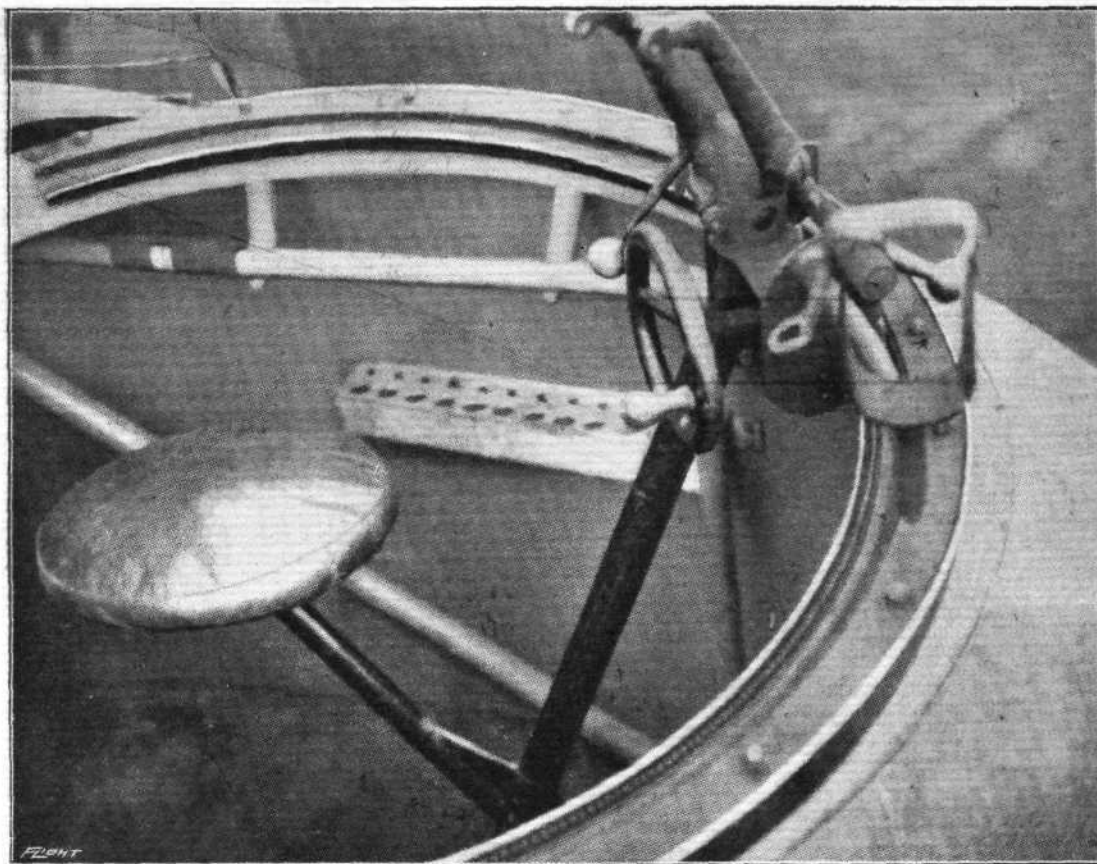
As may be seen from the plan view of the complete machine, the shape of the *aileron*s is somewhat unusual. These are

and cables, which pass direct over pulleys and along tubes running parallel with the wing spars and then over inclined pulleys up to the *aileron* cranks. The wheel column is pivoted to a long crossbar extending the whole length of the fuselage and carrying at each end cranks for the elevator control wires which at intervals are carried through fibre guides socketted to the frame. The cranks of the elevators are concealed inside the rear end of the fuselage, whilst those of the rudder (which is fitted with duplicate cranks and wires) are external. A modified dual control is fitted, which allows the assistant pilot to work the elevator and rudder only. For this purpose a socket is mounted on the pivot bar into which can be inserted a plain steel tube which is normally carried in clips behind the pilot's back. A second rudder bar, the design of which is shown in Fig. 22, is carried under the dashboard, and can readily be dropped into position into a square socket partially sunk into the floor of the cockpit and connected to the pilot's rudder bar by cranks and a link.



B. Underside of the nacelle showing bomb magazines and racks, also trap-door in rear cockpit.





C. Front cockpit and gun mount.

#### Personnel.

Seats are provided for a crew of four, who are carried as follows:—One in the front cockpit; one in the pilot's seat; one at the pilot's side; one in the rear cockpit.

All can, if necessary, change places whilst the machine is in the air. Between the front cockpit and that of the pilot a sliding panel is provided through which the gunner can crawl. The seat at the side of the pilot folds up and slides back into a cavity under the coaming of the nacelle, and when in this position allows access down a narrow and inclined passage-way to the rear cockpit. The machine can hardly be designed to satisfy the requirements of the average pilot in regard to view, as from the pilot's seat it is very difficult to see the ground properly on account of the position of the lower main plane and the width of the fuselage.

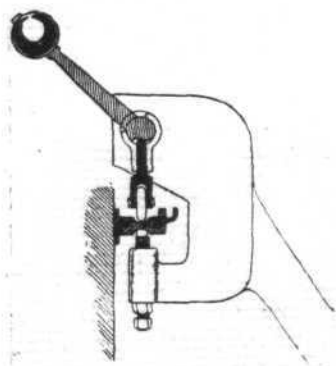


Fig. 23.

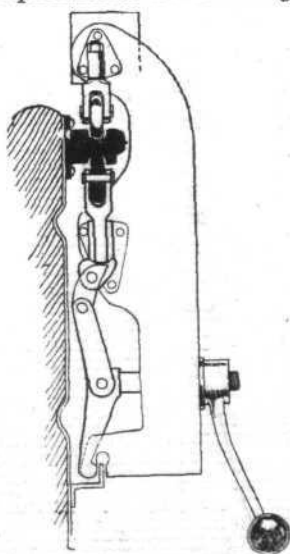


Fig. 24.

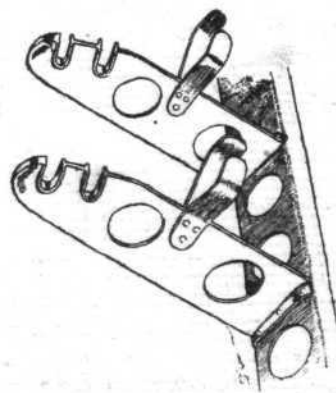


Fig. 25.

#### Armament.

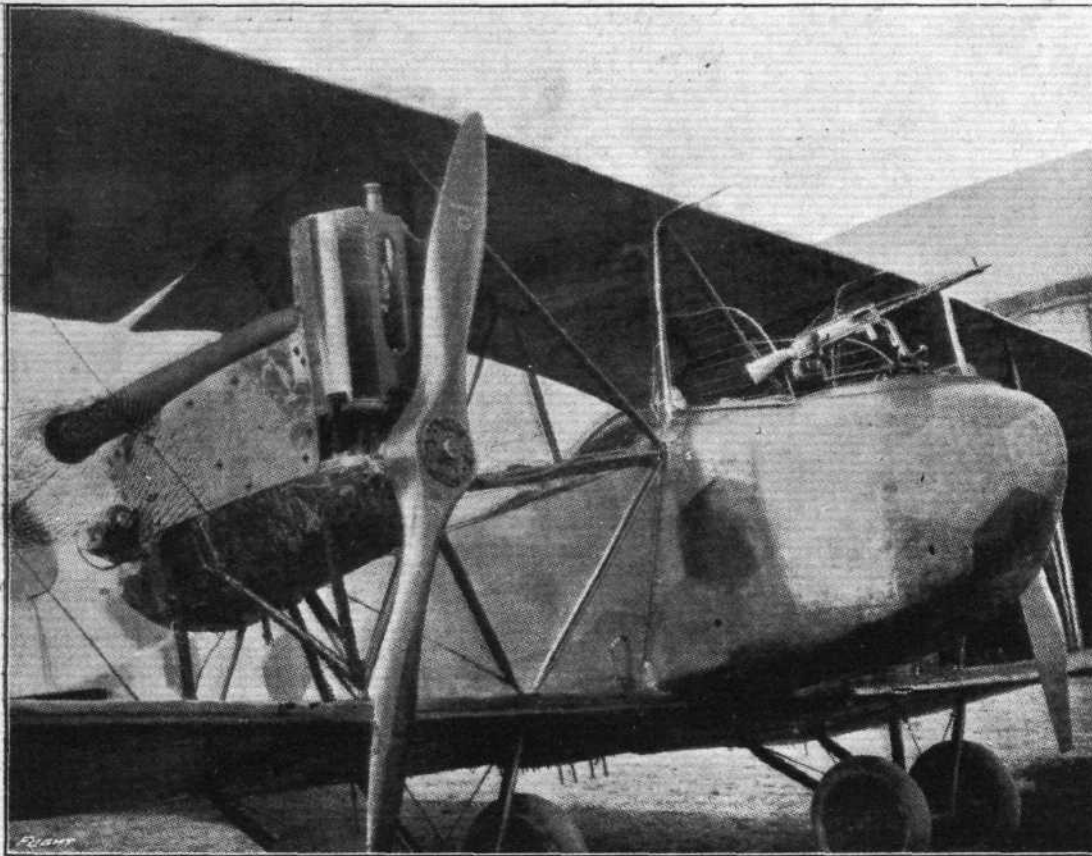
Two Parabellum guns are mounted, one in the front cockpit, and one in the rear, and provision is made for mounting a third or for transferring one of the others on the floor of the rear cockpit, so that it can fire backwards and under the tail of the machine. For this purpose a large trap door, which is visible in the photograph B, is provided in the floor of the fuselage behind the rear cockpit. This trap door has celluloid windows and is normally kept closed by springs. It is lifted up by a small hand winch fitted with a ratchet. It is of passing interest to note that whereas in the Friedrichshafen a similar trap door was kept open by means of springs, in the A.E.G. springs are used to keep the door closed. In

the front cockpit the gun is supported on a carriage which runs round a partially circular rail which is strongly supported from the fuselage by a framework of steel tubes. Forming part of this frame is an inclined steel tubular column, the base of which is fitted in a swivel bearing in the floor of the cockpit, and on this is mounted an adjustable seat for the gunner. A toothed rack runs round the rail and engages with a spur pinion driven by a hand wheel so that the gunner, when occupying his seat, swivels himself round as well as the gun. This gun mounting is shown in photograph C, and a diagrammatic section of the carriage is given in Fig. 23. The vertical swivel of the fork-ended gun carrier is locked by a ball-ended lever and a similar lever is employed for locking the carriage itself to its rail.

This action is accomplished by a cam device which depresses the roller of the carriage and squeezes the rail section between the roller and an adjustable set screw which normally just clears the groove on the under side of the rail. In order to

prevent the forward gunner from shooting the tractor screws, preventative shields of light steel tube are carried between the upper edge of the forward cockpit and the inclined struts of the centre section. These impose a limit to the travel of the gun. In the rear cockpit the gun mounting is U-shaped in plan form, and here again the principle of a carriage running on a rail and driven by a spur gear meshing with a toothed rack is employed, though

in this case the gunner's seat does not revolve with the gun. The carriage is of a somewhat similar type to that used in the front cockpit, but the method of locking it is different. This is shown diagrammatically in Fig. 24. The rail is provided with grooves both above and below, there being two rollers at the top and one underneath. Normally, when the gun carriage is free, the latter is clear of the rail, but when the locking mechanism is brought into action it is forced upwards so that the rail is gripped between the rollers, thus avoiding any possibility of shake at this point, and at the same time a positive lock is obtained on a second rail carried below the first. When the ball-ended hand lever is tightened, its effect is to squeeze the lower



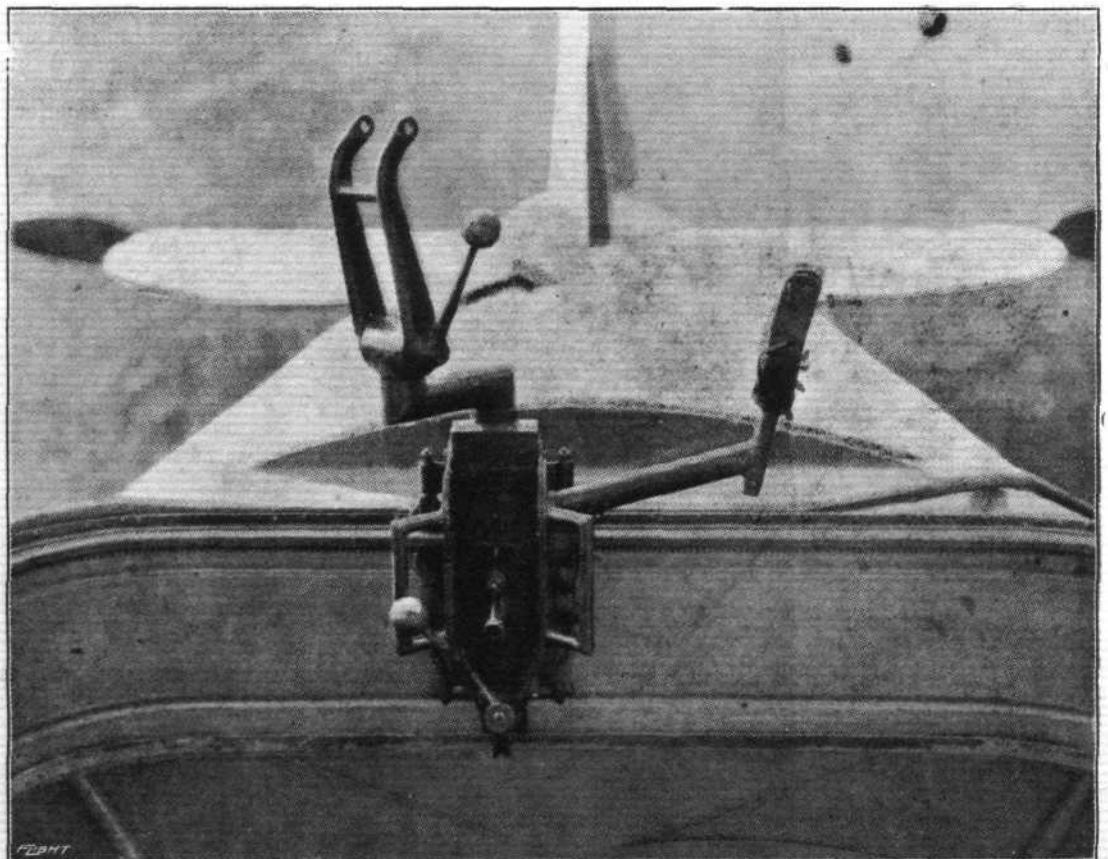
**J. Three-quarter front view of nacelle and engine egg.**

rail between two jaws. The movable jaw is, however, connected up by a link to a small cam, the base of which abuts against the foot of a fork-ended rod which carries the lower roller and is free to move up and down in a guide, to the base of which the cam is pivotted. By this means a very secure and rapid locking device is obtained. In the front of the rear cockpit a locker is provided which would be capable of holding ammunition, and beneath this a series of racks of the type shown in Fig. 25. These racks are not strong enough to hold anything very heavy, and are placed approximately 5 ins. apart. Their exact purpose is not known.

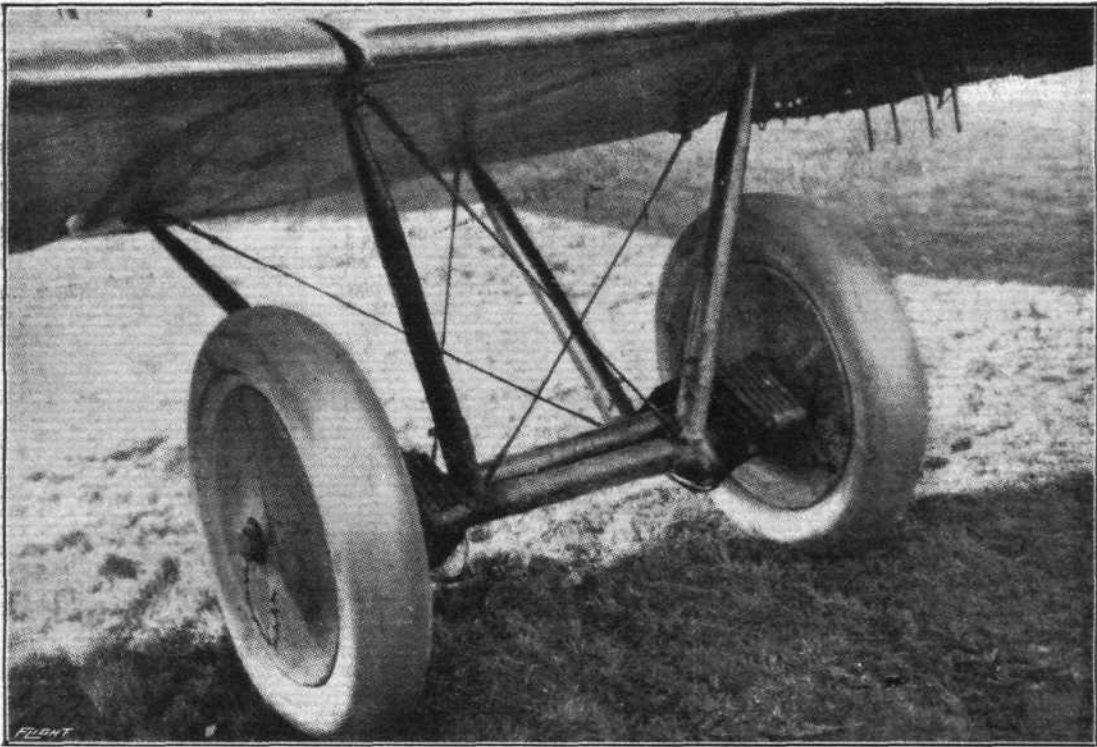
#### *Bombing Gear.*

Three racks for holding twenty-five pounder bombs are installed on the machine: two side by side on the left side of the rear cockpit, and one on the right side of the petrol tanks in the space between the pilot's and rear cockpits. This rack is covered by a detachable wooden lid which acts as the floor of the narrow gangway mentioned above. Underneath the centre of *nacelle* provision is made for carrying two or more large bomb racks, which, however, were not in use on this machine. Underneath the lower main plane, two at each side of the *nacelle*, are fixed bomb clips which are capable of supporting bombs roughly 8 inches in diameter. They

**L. Gun mounting in rear cockpit.**







D. Undercarriage.

are held in position by a belly-band consisting of two steel strips, clearly shown in the photograph B. Eleven and a half inches in front of this clip is a bracket suitable for a circular section of 4 inches in diameter, and 13½ inches in the rear of the clip is a second bracket suitable for a 5-ins. diameter section. The bomb would thus appear to be 50 kgs. In the photograph the belly-bands are shown clipped out of the way. At their fixed end they are supported on a crosshead, a sketch of which is given in Fig. 26. This in turn is carried on a bracket clipped to a steel tube running parallel to the wing spars and braced thereto by tubular steel girders. The cross head is free to swivel on the bracket against the action of a coiled spring which, when the bomb has been released, twists the crosshead round against a stop, so that the belly-band is forcibly swung round and now faces the direction of flight instead of lying edgewise on to it. The ends of the steel strips are swivelled on the crosshead, and here again coil springs are used, so that the tendency is for the belly-band to be held flat against the lower surface of the bottom main plane, and out of the way of the other clip.

When the bombs are in position, the rings which are fitted on the free end of the belly-band are caught between the jaws of a trigger mechanism, illustrated diagrammatically in Fig. 27. This device is carried on the same tube which supports

the crossheads, as already mentioned. Lying parallel to this tube and between it and the leading spar is a control rod fitted with two levers which are connected respectively to the two bomb trip gears, and this rod is operated by a quadrant lever mounted in the front cockpit. In order to allow one trip gear to be worked at a time, the link of the outer trip is provided with a slot where it is pivotted to the trigger

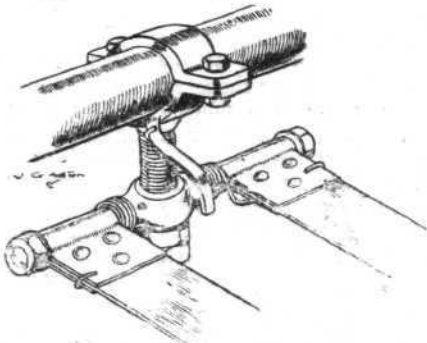


Fig. 26.

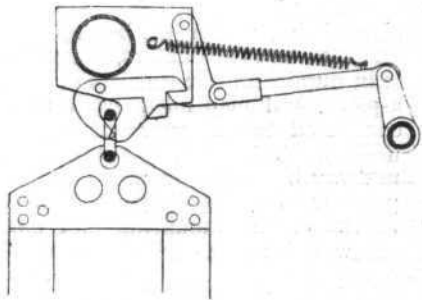
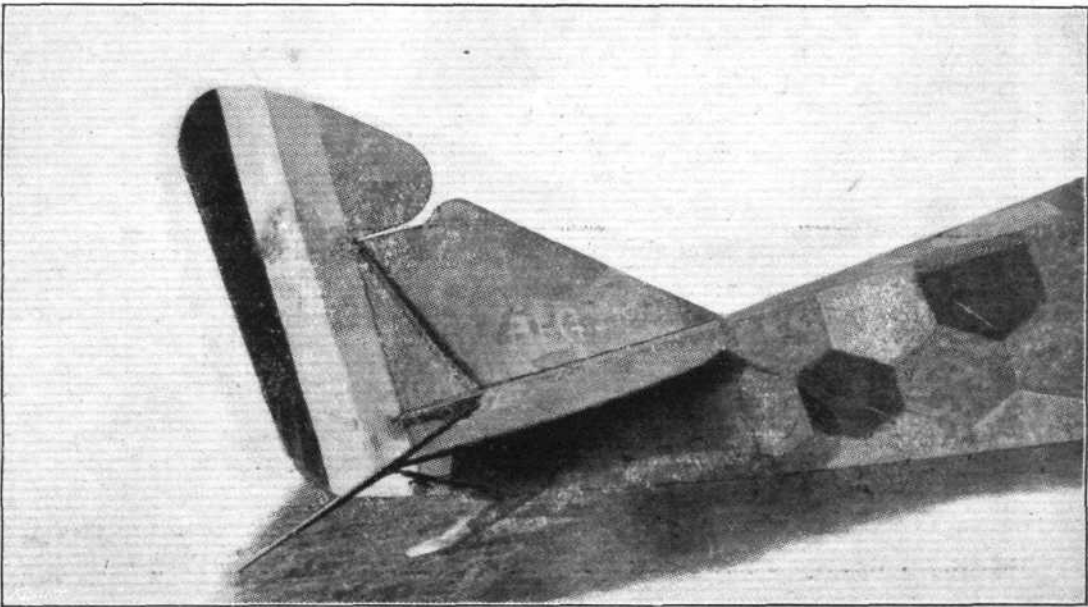


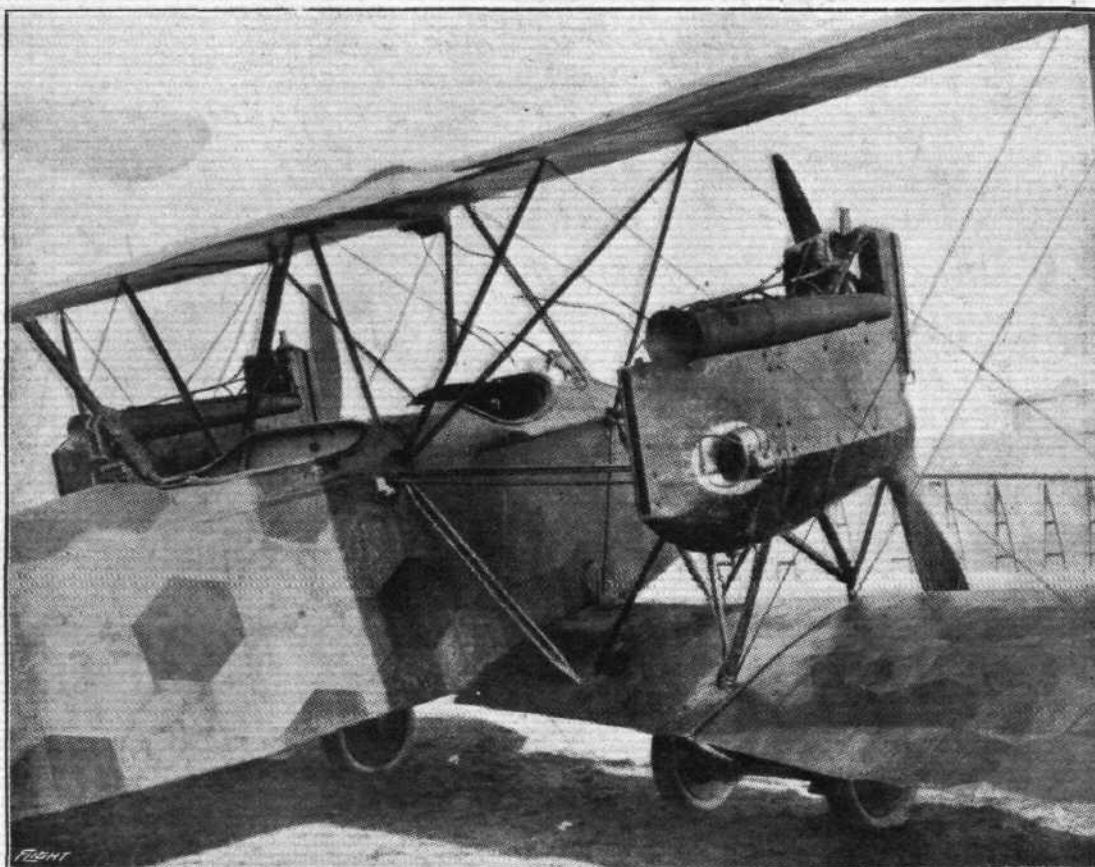
Fig. 27.

release. On working the lever in the cockpit, therefore, its first action up to half way over the quadrant is to release the bomb nearest the *nacelle*, whilst a further movement releases the outer bomb. An exactly similar method is em-

E. Arrangement of tail.



ployed for operating the bombs carried underneath the other wing. The levers in the front cockpit are all mounted on a common bracket built up of steel tubes, and are arranged as follows:—First, there are the two levers which control the two bomb magazines in the rear cockpit. These are provided with thimbles and chains, so that they cannot be operated accidentally. Next, a single lever which controls the larger bomb clips on the right wing. These are capable of being secured by split pins inserted in their quadrants. Next, there is a lever which in this particular machine was furnished with no action at all, but is evidently designed for manipulating the large bomb carriers when these are installed. Behind it are, first, a single lever for the left hand outer bomb clips, and, finally, the lever for working the bomb magazine on the right hand side of the nacelle.

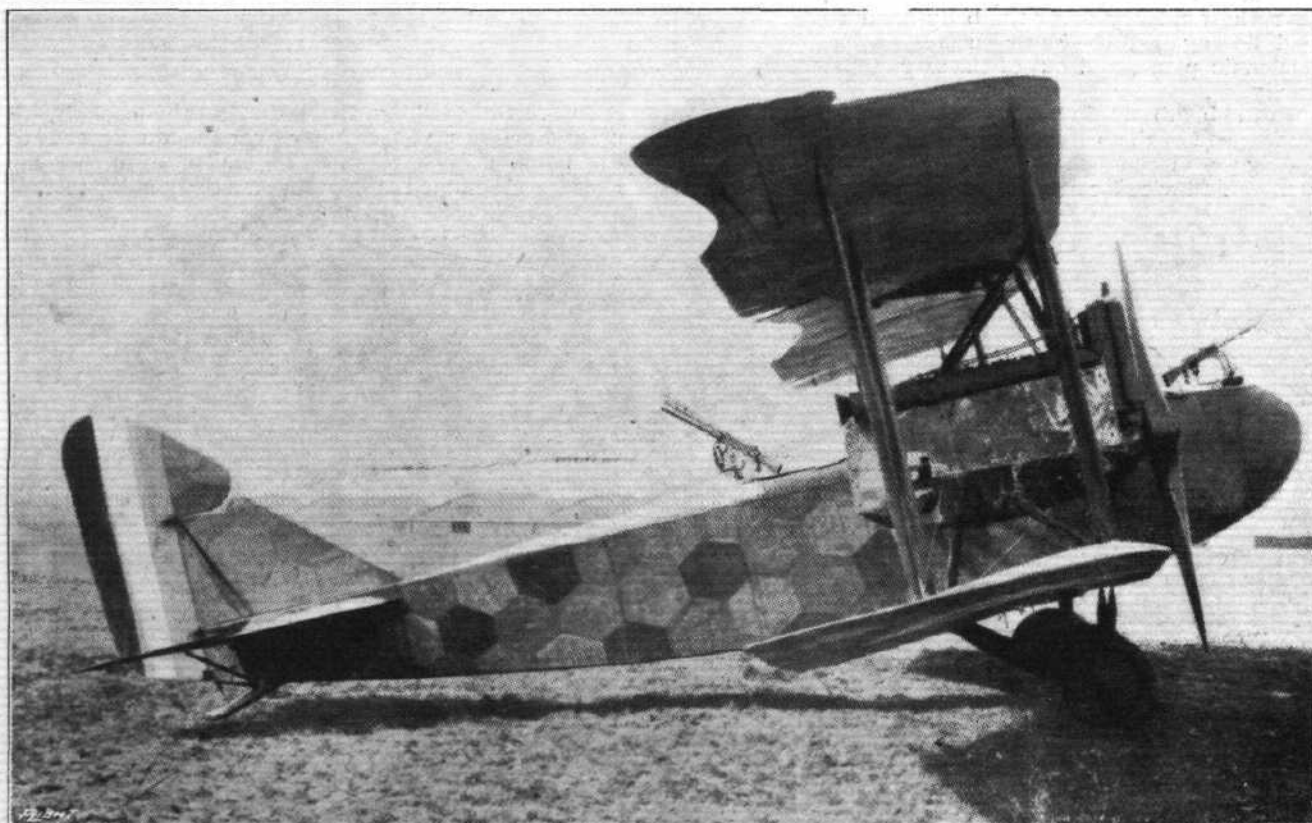


F. Three-quarter rear view of fuselage and engine mounting.

### Landing Gear.

The landing gear of the A.E.G. bomber is simply an elaboration of that which has become practically a standard fitting on single and two-seaters, except that in this machine the gear is in duplicate. It consists of two axles carrying two wheels a-piece, and suspended from pairs of V struts. One pair is connected to the spars of the centre section immediately underneath the engine strut sockets, and the other to the spars midway between this point and the fuselage and at the same point from which diagonal struts are taken from the spars to the engine mounting and nacelle. This, together with the wire bracing of the landing gear struts provides a com-

pletely triangulated construction. The struts are, however, connected by ball joints similar to those used with the engine struts, so that in case of strain a certain amount of free movement can take place. The pairs of V struts carry at their foot a hollow steel crossbar having the section of a trough, and in this lies the axle which connects the two wheels. As shown in the sketch Fig. 28 and in the photograph D, the fixed beam has forward and rearward extensions, at each end of which are anchored the ends of the batteries of coil springs which act as shock absorbers, and at their other ends are hooked to a horn plate on the wheel axle. Each battery of springs, of which there are four to each axle,



G. Side view.



consists of 18 springs. A yoke of stranded steel cable restricts the movement of the axle beyond a certain limit. The tyres are 32 ins. x 6 ins. = 810 x 150. A tail skid of massive proportions is used. This is of the shape shown in photograph E, and is built up entirely of welded steel. The springs against which it works are concealed inside the tail end of the fuselage.

#### Wireless.

The machine is internally wired for wireless, and a special dynamo for supplying current for this purpose and also for heating is installed on the right hand engine. This dynamo bears the following inscription:—

#### Telefunken.

J. P. Flieg. C 1916. Type D.

Alternating current 270 watts. 5 amperes. 600 frequency. Continuous current 50 volts. 4 amperes. r.p.m. 4,500.

The dynamo is mounted on brackets acetylene-welded to the steel engine bearers, and is normally completely enclosed in a detachable fairing. Its position is clearly shown in photograph F. The dynamo drive embraces the pulley which is a standard fitting on the 260 h.p. Mercedes, but in this particular case the clutch gear whereby the driving pulley can be disconnected from the engine as required appears to have been discarded. Two sets of wires are taken from the dynamo inside flexible metal conduits to a pair of plugs situated at the junction of the fuselage and the right hand lower main plane. Here they terminate in plug sockets, so designed that the plugs cannot be inserted wrongly. One of these wiring circuits applies to the heating system, and wires for this purpose are carried to points in all three cockpits, whilst the other circuit is for wireless and terminates in a plug adapter in the rear cockpit. No wireless instruments were fitted. Two plug sockets for the heating installations are arranged in the rear cockpit; two in the pilot's cockpit and one for the forward gunner. A small plate on the pilot's dashboard carries the following inscription, but no definite information is given:—

F. T. Fitting. W/T Set.

#### Aeroplanes.

Type 94.	NY	1125/16.
Fitting, No. 85A.		
Driving propeller.	Type.	Direct coupling.
Length of aerial wires —	—	—
Telefunken transmitter.	—	metres.
Huth transmitter.	—	metres.
D transmitter —	—	metres.
G transmitter. —	—	metres.

In addition to these two circuits, there is a lighting installation in conjunction with a battery carried in a box in the rear cockpit. From here, wires are taken to each cockpit and also to the tail and via the leading edge of the upper plane to the extreme outside strut of each wing. On these struts red and green lights are carried, the lamps for this purpose taking the form shown in Fig. 29. Inspection lights are provided at convenient points in each cockpit over the dashboard, instruments, &c.

For the most part the lighting wiring is contained inside a light celluloid conduit.

#### Instruments.

These comprise twin engine revolution counters, twin air pressure gauges for the petrol supply, electric thermometer, altimeter, petrol level gauges, &c. All of these are of recognised types and call for no detailed description.

#### Camouflage.

This machine is camouflaged in six different colours on a uniform system covering every portion. The colours are arranged in hexagons measuring roughly 18 ins. across the flats, and the colours are sage green, reddish mauve, bluish mauve, black, blue and grey. These colours are not flat washes, but are softened by being stippled and splashed with paint of a lighter tone. The effect gained is well shown in photograph G. Considerable care appears to have been taken with this camouflage scheme, which is presumably effective.

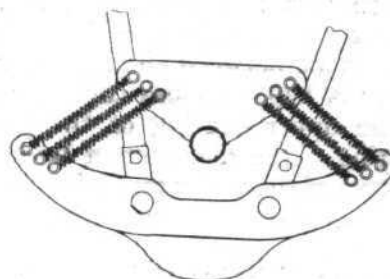


Fig. 28.



Fig. 29.

#### Fabric and Dope.

The fabric throughout is of good quality, and the dope acetate of cellulose.

#### Propeller.

Diameter 10 ft. 3.8 ins. ± .20 in.

Pitch 59.3 ins.

The following table gives the thicknesses of the various laminae used in construction of the air-screw. The laminae are numbered from the trailing to the leading edge:—

No.	Material	Thickness in inches.	No.	Material	Thickness in inches.
1	Walnut	.73	6	Mahogany	.80
2	Mahogany	.80	7*	Mahogany	.49
3	Mahogany	.80	8*	Mahogany	.40
4	Mahogany	.80	9	Mahogany	.80
5*	Mahogany	.80	10	Walnut	.83

\* These laminations were of a quite different kind of mahogany, probably African.

Only one air screw has been seen and dimensioned. Thus it is unknown whether all air screws would have laminae of similar thicknesses and of similar timbers. There is no apparent reason why these laminae should be of different thicknesses. It is surmised that either the enemy is short of timber or that he has a highly scientific reason for so doing that we do not know. The port and starboard air screws rotate in opposite directions.



K. Three-quarter rear view.

# THE 240 H.P. (8-CYLINDER) MERCEDES.

(Concluded from page 620.)

## Water Circulation.

THE water pump driven from the camshaft vertical driving-shaft differs slightly from the 160 h.p. Mercedes pump, chiefly in the drive. In the 160 h.p. pump the rotor is fixed directly to the vertical camshaft driving spindle by six serrations. In the 8-cylinder Mercedes pump the spindle of the pump rotor is hollow and is driven from the lower part of the vertical driving shaft by means of a dog clutch. There is a clearance of 2 mm. between the internal diameter of this hollow spindle and the vertical shaft. The rotor floats upon this hollow spindle, and is attached by means of six serrations, which allows a slight vertical movement between the spindle and the rotor. The latter is kept in close contact with the lower face of the upper bearing of the pump spindle by a coil spring. The diameter of both the inlet and outlet passages of the water pump is 35 mm. The water jacket capacity of one cylinder is 1,280 c.cs.

On the aeroplane from which this engine was taken a small radiator was fitted in the centre of the top plane, having its intake pipe leading from the front cylinder of the engine and its outlet leading through the right hand strut of the *cabane*. Further details of the construction of the water pump are illustrated in the sectional arrangement of the pump (Fig. 21).

## Water Pump Test Report.

The water pump was detached from the engine and tested separately, coupled to an electric motor. Separate delivery curves were taken against varying pressure. The results of these tests are given in the

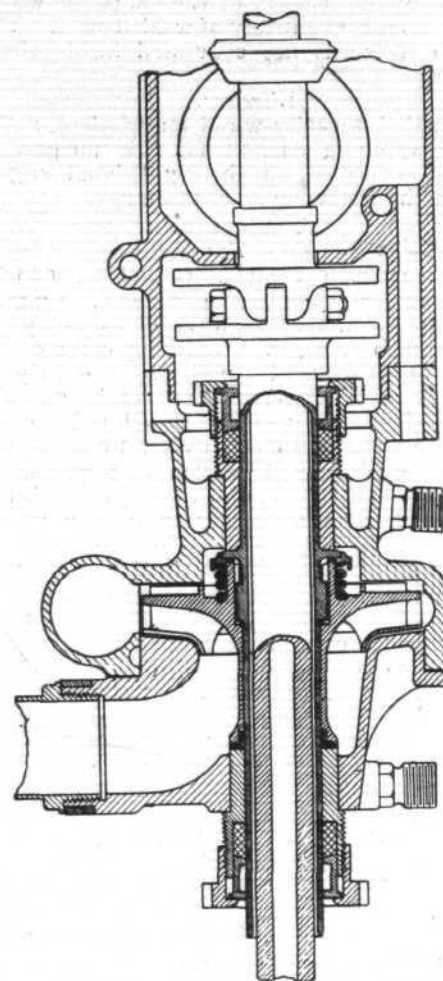


Fig. 21.—Section of water pump.

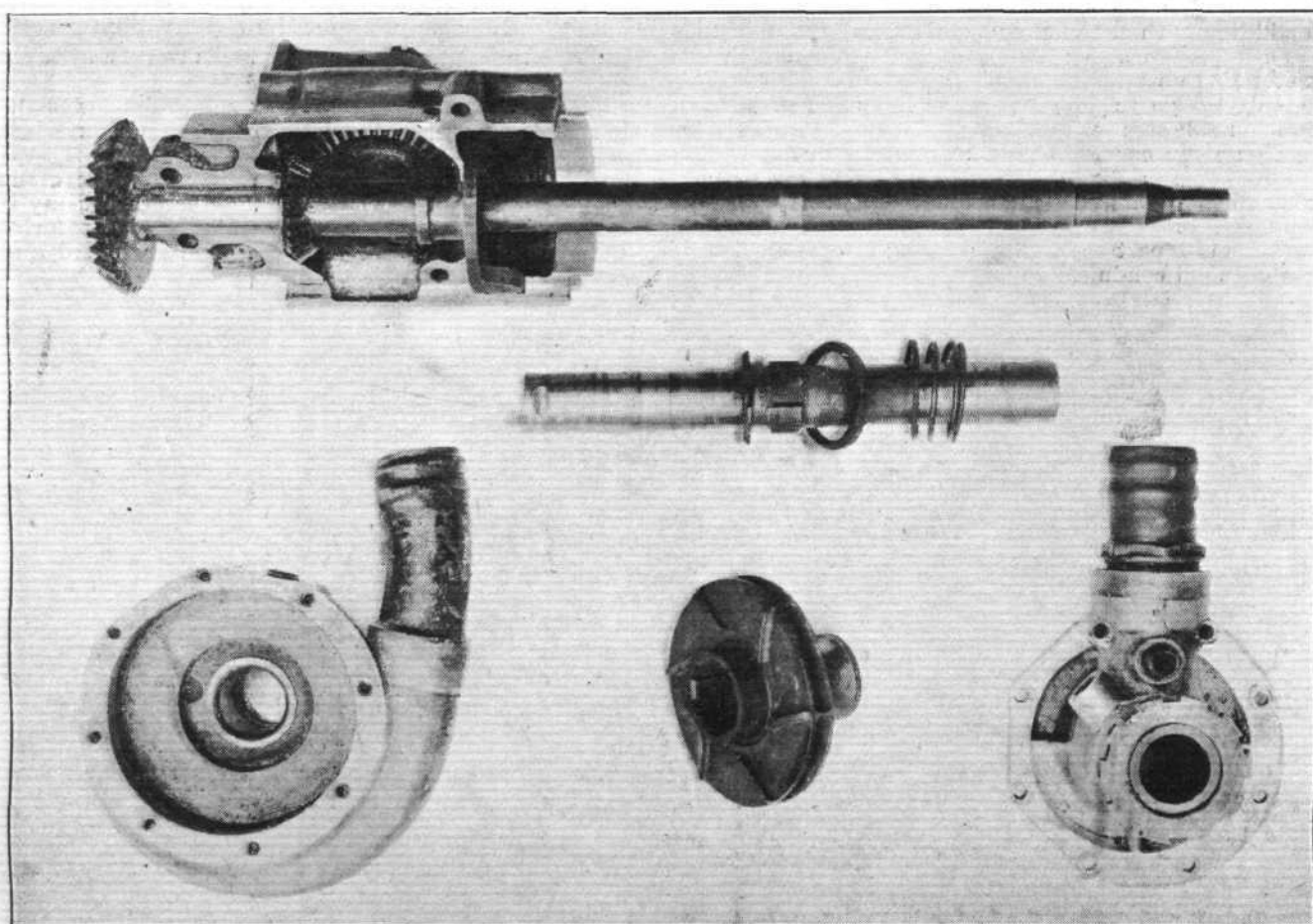


Fig. 22.—Water pump and vertical shaft dismantled.



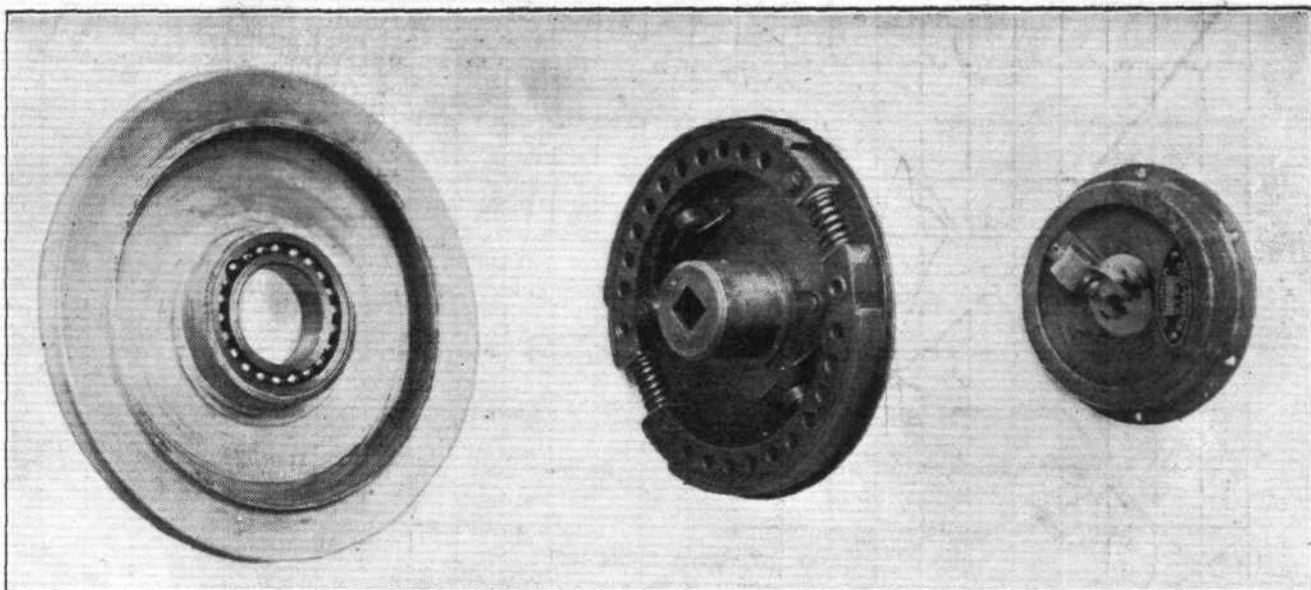


Fig. 23.—View of wireless dynamo clutch-pulley dismantled.

diagram (Fig. 27). At a pressure of 2 lbs. per sq. in. it was found that 1,000 r.p.m. was the lowest speed at which delivery occurred, and similarly at 4 lbs. per sq. in., and 6 lbs. per sq. in., the lowest delivery speeds were 1,400 r.p.m. and 1,700 r.p.m. respectively. As the ratio of the pump speed to crankshaft speed is 1.5-1, these figures correspond to engine speeds of 667, 934, and 1,133 r.p.m. respectively. At the normal engine speed of 1,350 r.p.m., the pump is delivering approximately 91 gallons per minute, this figure being estimated from the curves. On

as shown in Fig. 21. The magnetos run at engine speed, and the unusual firing sequence, as already mentioned, is as follows:—1, 3, 2, 4, 8, 6, 7, 5. The ignition timing is  $30^\circ$  early fully advanced. Two Bosch 3 point plugs are fitted, one on either side of each cylinder, opposite and below each valve.

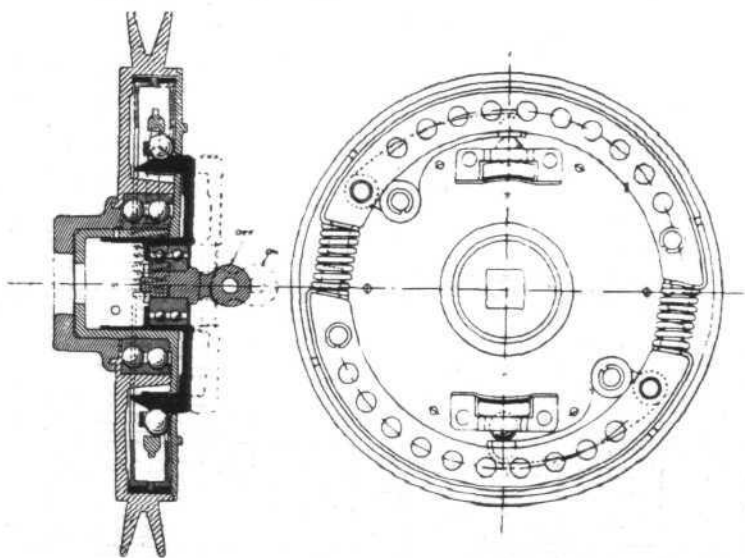


Fig. 24.—Sectional arrangement of wireless-drive clutch-pulley.

dismantling the water pump, it was found that the hollow driving spindle of the rotor was binding on the vertical driving shaft, in spite of the clearance allowed, and also the pump rotor was binding tightly with rust and mud upon its serrations on the hollow spindle, so that no floating action of the rotor or movement of the spring were possible.

#### Ignition.

Two H.L.8 type Bosch magnetos are fitted transversely on brackets at the rear end of the engine, and are driven as in the 160 h.p. engines, through dog clutches, directly off the camshaft vertical driving shaft through bevel gears below the water pump,

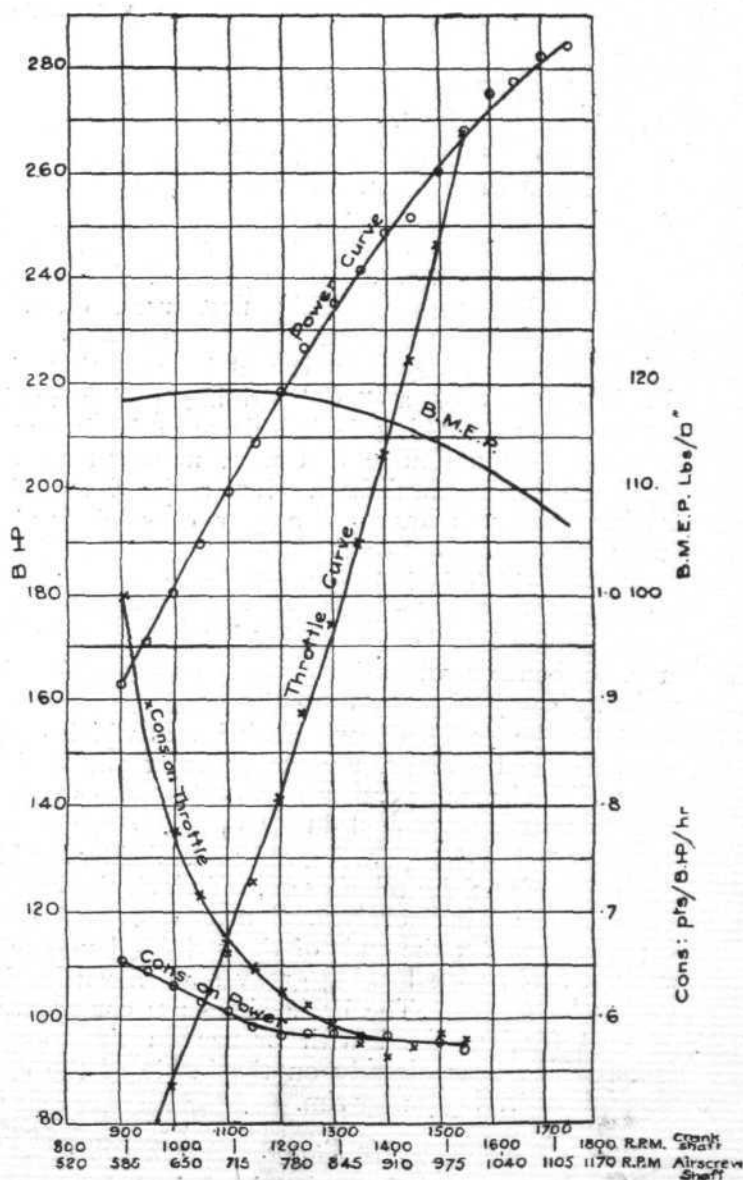


Fig. 25.—Throttle, power, and consumption curves.

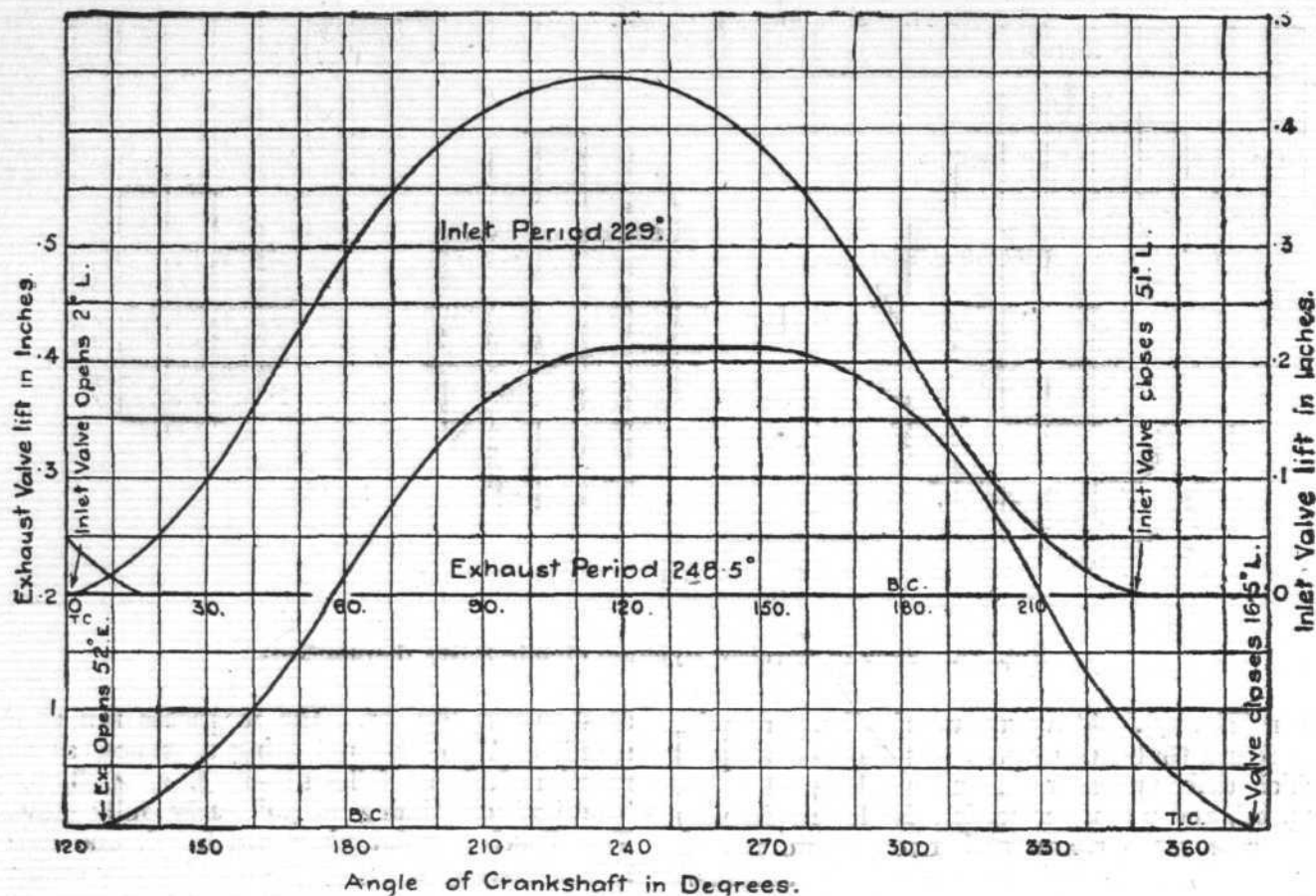


Fig. 26.—Valve lift diagram.

#### Wireless Dynamo Clutch-Pulley.

A friction-clutch for driving the wireless dynamo is fitted on the rear-end of the crank-shaft, details being shown in Fig. 24. This clutch is thrown in or out of engagement by a cable and lever, which can be operated either by the pilot or observer. This type of clutch is now fitted on most of the enemy machines, but was probably first used on the 8-cylinder Mercedes engines.

On reference to Fig. 24, it will be seen that the clutch consists of a "V" driving pulley made of aluminium for taking the belt drive to the dynamo, running upon a double ball race, mounted on an extension of the crankshaft. Inside the rim of the driving pulley is arranged a pair of semi-circular brake shoes mounted on a plate forming part of the extension which is bolted to the rear end of the crankshaft. These brake-shoes are held apart by two strong coil springs that serve to hold the brake-shoes in close contact with the driving pulley whilst in action. The brake-shoes are thrown out of engagement by the action of two small levers which compress the coil springs, and so contract the brake-shoes. The brake levers are operated by two striking wedges that are pushed in or out of engagement by the action of the operating rod controlled by a cable and spring from the pilot's seat. To lock the brake-shoes in the "in" or "out" positions, steel balls are used between the ends of the striking levers and wedges, fitted with locking grooves as shown in the sectional drawing. The brake-shoes are constructed of steel forgings lined with bronze on their outer faces, which bear directly on the inside of the cast aluminium driving pulley rim.

#### Air Pump.

The air pump, of the spring loaded plunger type, is fitted towards the rear end of the camshaft casing

between the half compression gear and No. 8-cylinder valve-rockers. The pump is operated by a cam

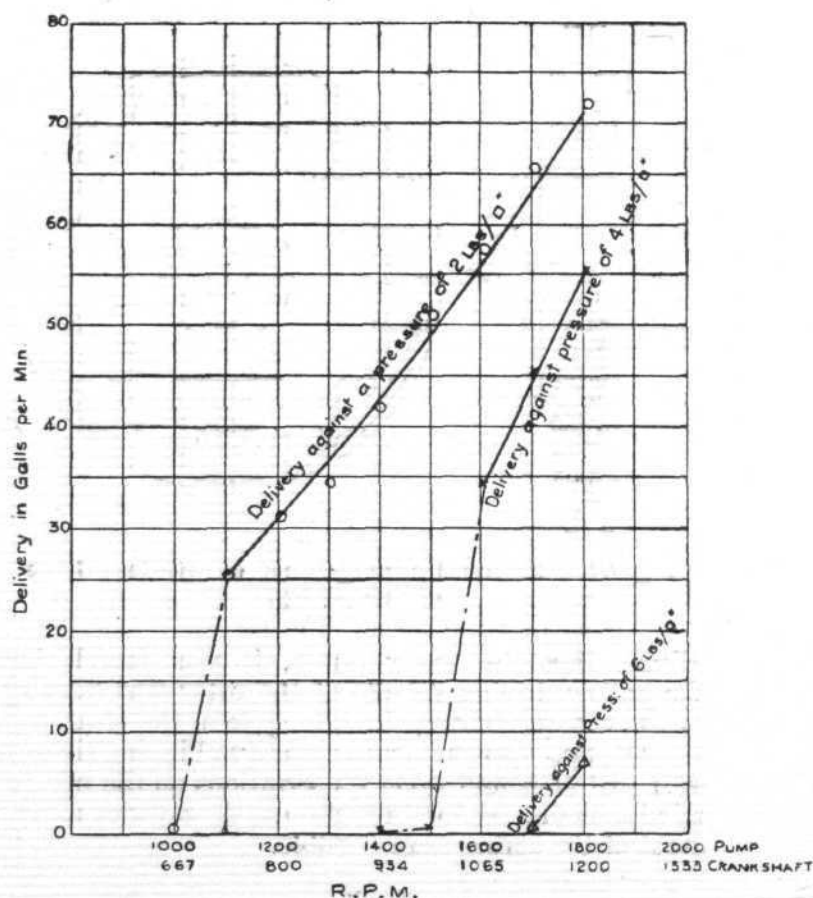


Fig. 27.—Water pump test diagram.

formed on the end of the camshaft. Further details of the air pump are shown in the arrangement of the half compression gear (Fig. 15).



## THE ROLL OF HONOUR.

THE following casualties are announced by the Air Ministry:—

### Killed.

Lieut. L. C. W. Bauchoppe, R.A.F.  
 2nd Lieut. W. M. Burfoot, Dorset Regt. and R.A.F.  
 2nd Lieut. W. G. Brown, R.A.F.  
 22nd Lieut. B. Cohen, R.A.F.  
 2nd Lieut. M. P. Crane, R.A.F.  
 2nd Lieut. W. S. Dann, The Buffs, attd. R.A.F.  
 2nd Lieut. S. Fine, R.A.F.  
 Lieut. C. K. Flower, R.A.F.  
 2nd Lieut. R. A. Fraser, R.A.F.  
 Lieut. L. George, A.S.C. and R.A.F.  
 2nd Lieut. W. J. K. Graham, R.A.F.  
 Lieut. F. V. Hall, R.A.F.  
 2nd Lieut. W. G. Hargrave, R.A.F.  
 Lieut. W. H. Hargreaves, Midd'x. Regt. and R.A.F.  
 2nd Lieut. G. W. Hawken, R.A.F.  
 2nd Lieut. S. T. J. Helmore, R. Fus. and R.A.F.  
 Lieut. A. Hindley, R.A.F.  
 2nd Lieut. A. W. Hinton, R.A.F.  
 Lieut. H. L. Hopkins, R.A.F.  
 2nd Lieut. G. S. Howard, R.A.F.  
 Capt. B. James, R.A.F.  
 P. F./O. J. M. Johnson, R.A.F.  
 2nd Lieut. E. J. C. Kidd, W. Yorks Regt., and R.A.F.  
 Major J. L. Kinnear, King's (L'pool Regt.) and R.A.F.  
 2nd Lieut. A. W. Kite, R.A.F.  
 2nd Lieut. J. B. C. Knight, R.A.F.  
 Lieut. W. J. K. Knoll, R.A.F.  
 Lieut. J. B. R. Langley, R.A.F.  
 Major P. V. Laverack, R.A.F.  
 2nd Lieut. J. C. Lowenstein, R.A.F.  
 Capt. C. R. Lupton, R.A.F.  
 Lieut. F. L. Mond, R.F.A. and R.A.F.  
 Capt. G. B. Moore, M.C., R.A.F.  
 2nd Lieut. M. C. Morton, R.A.F.  
 2nd Lieut. C. F. Mossman, R.A.F.  
 2nd Lieut. J. Napier, R.A.F.  
 2nd Lieut. H. A. Nash, R.A.F.  
 Lieut. A. H. Peters, R.A.F.  
 2nd Lieut. C. L. Price, R.A.F.  
 2nd Lieut. J. E. Reynolds, R.A.F.  
 2nd Lieut. E. G. Rice, R.A.F.  
 Lieut. W. H. Robinson, R.A.F.  
 2nd Lieut. T. A. Royds, R.A.F.  
 2nd Lieut. C. U. Sankey, E. Kent Regt., attd. R.A.F.  
 2nd Lieut. T. F. Scott, R.A.F.  
 2nd Lieut. S. Sephton, R.A.F.  
 2nd Lieut. C. R. Southwell, R.A.F.  
 P.F./O. R. J. W. Taylor, R.A.F.  
 Lieut. L. R. Thacker-King, R.A.F.  
 2nd Lieut. E. P. J. Touche, Essex Regt. and R.A.F.  
 2nd Lieut. H. J. Townson, W. Yorks Regt., attd. R.A.F.  
 2nd Lieut. G. N. Traunweiser, R.A.F.  
 Lieut. M. H. W. Trendell, R.A.F.  
 2nd Lieut. H. F. E. Trigg, R.A.F.  
 Lieut. R. G. Tunbridge, R.A.F.  
 2nd Lieut. S. Walker, Camb. Regt. and R.A.F.  
 2nd Lieut. J. G. Ward, Lan. Fus. and R.A.F.  
 Lieut. C. D. Wells, M.C., R.A.F.  
 2nd Lieut. A. J. P. Wheeler, R.A.F.  
 Lieut. C. Whelan, R.A.F.  
 Lieut. B. F. L. Yeoman, Lond. Regt. and R.A.F.

### Previously Missing, now reported Killed.

Lieut. G. M. Cartmell, R.A.F.

### Died of Wounds.

2nd Lieut. A. E. Heyes, R.A.F.  
 Lieut. F. J. Morgan, R. Fus. and R.A.F.  
 2nd Lieut. A. G. H. Lane, R.A.F.  
 2nd Lieut. F. E. Pashby, R. Berks. Regt., attd. R.A.F.  
 Lieut. R. W. Rumsby, R. Suss. Regt. and R.A.F.  
 2nd Lieut. R. J. Scott, R.A.F.  
 Lieut. R. W. Trubridge, R.A.F.

### Wounded.

Lieut. F. Ambler, W. Yorks Regt., attd. R.A.F.  
 Capt. E. S. Arnold, R.A.F.  
 2nd Lieut. J. H. Acton, R.A.F.  
 Lieut. G. M. Atkinson, R.A.F.  
 Lieut. A. E. G. Bailey, A.S.C., attd. R.A.F.  
 2nd Lieut. H. V. Barker, R.A.F.  
 2nd Lieut. V. G. Barry, R.A.F.  
 2nd Lieut. F. P. Bellingham, R.A.F.  
 2nd Lieut. H. P. Bennett, R.A.F.  
 Lieut. P. W. Booth, R.F.A. (T.F.), attd. R.A.F.  
 2nd Lieut. J. S. Bradley, R.A.F.

2nd Lieut. N. Braithwaite, R.A.F.  
 2nd Lieut. J. H. Bryer, R.A.F.  
 2nd Lieut. C. G. Capel, R.A.F.  
 2nd Lieut. J. K. Clarke, Conn. Rangers, attd. R.A.F.  
 Lieut. H. A. Deakin, S. Staffs. Regt., attd. R.A.F.  
 Lieut. R. C. St. J. Dix, M.C. Lond. Regt. (T.F.) and R.A.F.  
 2nd Lieut. N. C. Dixie, R.A.F.  
 2nd Lieut. J. R. Evans, R.A.F.  
 2nd Lieut. L. E. Evans, R.A.F.  
 2nd Lieut. W. H. Gibson, R.A.F.  
 Lieut. G. W. T. Glasson, R.A.F.  
 Capt. A. F. W. Gregory, R.A.F.  
 2nd Lieut. K. G. P. Hendrie, R.A.F.  
 2nd Lieut. H. G. Hooker, Midd'x Regt., attd. R.A.F.  
 2nd Lieut. J. C. Hopkins, R.A.F.  
 2nd Lieut. P. Hughes, R.A.F.  
 2nd Lieut. W. C. Ibbott, R.A.F.  
 2nd Lieut. H. G. Jackson, R.A.F.  
 2nd Lieut. L. H. Jones, R.A.F.  
 2nd Lieut. O. Jones, R.A.F.  
 2nd Lieut. M. B. Joseph, R.A.F.  
 Lieut. S. P. Kerr, R.A.F.  
 2nd Lieut. A. L. Kidd, R.A.F.  
 2nd Lieut. E. G. Lathan, R.A.F.  
 2nd Lieut. F. H. Lumb, W. Riding Regt., attd. R.A.F.  
 2nd Lieut. C. C. Macdonald, R.A.F.  
 Lieut. D. MacGregor, K.O. Scot. Bord. and R.A.F.  
 Lieut. W. A. MacMichael, R. Scots, attd. R.A.F.  
 2nd Lieut. R. C. Mais, B.W.I.R. and R.A.F.  
 Capt. J. G. Manuel, D.S.O., R.A.F.  
 Lieut. W. H. Matthews, R.A.F.  
 2nd Lieut. A. R. A. Millar, S. Lancs. Regt. attd. R.A.F.  
 Lieut. D. J. M. Miller, R.A.F.  
 2nd Lieut. K. C. Mills, R.A.F.  
 2nd Lieut. S. C. Mimmack, R.A.F.  
 Capt. W. Mitton, Lincs. Regt. and R.A.F.  
 2nd Lieut. D. K. Moore, R.A.F.  
 Major R. F. S. Morton, R.A.F.  
 2nd Lieut. S. Moxey, R.A.F.  
 Capt. J. P. Nickalls, R.F.A. and R.A.F.  
 2nd Lieut. F. L. Norden, R. Scots, attd. R.A.F.  
 Lieut. J. V. Ould, R.A.F.  
 Lieut. J. R. Paisley, R.A. and R.A.F.  
 2nd Lieut. H. S. G. Palmer, R.A.F.  
 2nd Lieut. W. I. Parke, R.A.F.  
 Lieut. L. Patterson, M.C., R.A., attd. R.A.F.  
 2nd Lieut. J. E. Philpott, R.A.F.  
 2nd Lieut. H. I. Pole, R.A.F.  
 2nd Lieut. W. D. Potter, Gord. Highrs. (T.F.), attd. R.A.F.  
 2nd Lieut. E. P. Pycroft, R.A.F.  
 2nd Lieut. F. J. Ralph, R.A.F.  
 Capt. W. O. Redgate, R.A.F.  
 Lieut. C. E. Reynolds, Lond. Regt. (T.F.) and R.A.F.  
 2nd Lieut. W. F. Roaks, R.A.F.  
 Lieut. H. P. Roberts, Suff. Regt., attd. R.A.F.  
 2nd Lieut. F. W. Rushton, M.C., R.A.F.  
 Major R. E. Saul, R.A.F.  
 2nd Lieut. F. A. Shippam, R.A.F.  
 2nd Lieut. M. R. Skinner, R.A.F.  
 Capt. H. P. Smith, Bord. Regt. (T.F.) and R.A.F.  
 Lieut. R. H. Stacey, Bedf. Yeo. (T.F.) and R.A.F.  
 2nd Lieut. C. J. Stanfield, R.A.F.  
 2nd Lieut. E. R. Stock, R.A.F.  
 Lieut. W. Susman, D. of Well. Regt., attd. R.A.F.  
 2nd Lieut. R. H. Walker, L.N. Lancs. Regt. (T.F.), attd. R.A.F.  
 2nd Lieut. F. W. Webster, R.A.F.  
 2nd Lieut. L. de V. Weiner, R.A.F.  
 2nd Lieut. J. A. Whalley, Labour Corps and R.A.F.  
 2nd Lieut. R. S. White, R.A.F.  
 2nd Lieut. H. Wisnekonitz, R.A.F.  
 2nd Lieut. T. O. Wrightson, R.A.F.

### Missing.

2nd Lieut. F. E. Boulton, R.A.F.  
 2nd Lieut. O. G. Brittorous, R.A.F.  
 2nd Lieut. F. J. Bull, R.A.F.  
 Lieut. C. R. Conron, R.A.F.  
 Lieut. W. E. Cowan, R.A.F.  
 2nd Lieut. A. S. Cross, R.A.F.  
 Capt. T. Durrant, R.A.F.  
 2nd Lieut. J. Finnigan, R.A.F.  
 2nd Lieut. J. C. Fitton, R.A.F.  
 2nd Lieut. L. G. S. Gadpaille, R.A.F.  
 2nd Lieut. C. L. Glover, R.A.F.  
 Lieut. E. W. C. G. de V. P. Viscount Glentworth, War. Yeo. (T.F.) and R.A.F.

2nd Lieut. S. Griffin, R.A.F.  
 Lieut. E. Harrison, R.E. (T.F.) and R.A.F.  
 Major. J. L. Harrison, R.A.F.  
 2nd Lieut. W. V. H. Hillyard, R.A.F.  
 2nd Lieut. J. Hollick, R.A.F.  
 2nd Lieut. H. G. Holman, R.A.F.  
 2nd Lieut. K. P. Hunt, R.A.F.  
 Lieut. W. J. King, R.A.F.  
 2nd Lieut. C. B. Law, Hussars and R.A.F.  
 2nd Lieut. H. J. Leavitt, R.A.F.  
 2nd Lieut. A. A. Malcolm, Lancers, attd. R.A.F.  
 Capt. C. C. D. Napier, R.A.F.  
 2nd Lieut. F. D. Nevin, R.A.F.  
 2nd Lieut. L. M. Nixon, R.A.F.  
 Lieut. N. F. Penruddocke, A.S.C. and R.A.F.  
 2nd Lieut. E. H. Piper, R.A.F.  
 2nd Lieut. E. R. Prideaux, R.A.F.  
 2nd Lieut. H. N. J. Proctor, R.A.F.  
 Lieut. C. C. Robson, R.A.F.  
 Capt. C. G. Rushton, R.A.F.  
 2nd Lieut. D. J. Russell, R.A.F.  
 2nd Lieut. R. C. Sansom, R.A.F.  
 Lieut. H. W. Sellars, R.A.F.  
 Lieut. W. F. Scott-Kerr, Loth. and Bord. Hse. and R.A.F.  
 2nd Lieut. M. F. Sutton, R.A.F.  
 2nd Lieut. J. Williamson, R.A.F.  
 2nd Lieut. J. C. Williamson, R.A.F.  
 Lieut. G. Wilson, R.A.F.

The following are reported by the War Office:—

#### Killed.

Capt. E. J. Jones, Aus. F.C.  
 Capt. G. F. Malley, Aus. F.C.  
 Lieut. A. L. D. Taylor, Aus. F.C.

#### Previously Missing, now reported Killed.

Capt. F. H. V. Bevan, R.F.C.  
 2nd Lieut. C. St. G. Campbell, R.F.C.  
 2nd Lieut. J. J. A. Hawtrey, R.F.C.  
 2nd Lieut. W. F. Poulter, R.F.C.

#### Wounded.

Lieut. E. A. Butler, R.A.F.  
 Lieut. J. A. A. Malhist, Can. Ry. Tps., attd. R.A.F.  
 Lieut. B. Stefansson, Manlt., attd. R.A.F.  
 2nd Lieut. F. C. B. Wedgwood, M.G.C., attd. R.F.C.

#### Missing.

Lieut. W. Bruce, Sask. Regt., attd. R.A.F.  
 2nd Lieut. A. Finnie, Aus. F.C.  
 Lieut. R. McK. Hall, Quebec Regt., attd. R.A.F.  
 Lieut. D. A. MacDonald, Can. For. Corps, attd. R.A.F.  
 Lieut. G. Nowland, Aus. F.C.  
 Lieut. W. A. Scott, Can. For. Corps, attd. R.A.F.

#### Previously Missing, now reported Prisoners of War in German hands.

2nd Lieut. T. E. H. Birley, R.F.C.  
 2nd Lieut. C. H. Clarke, R.F.C.



## THE FACTS ABOUT THE LIBERTY MOTOR.

So much theatrical splash-story stuff has been written about the Liberty motor—indeed one critic nicknamed it the Bronsonia, for the Belle-of-New-York manner of its original record—that we are glad to have the opportunity of publishing the actual technical facts of its composite design, as officially given out by Mr. Secretary Baker to the American public.

Of course, practically all four-stroke motor design is a composite affair; yet ordinarily, the composition is a leisurely process. In this case, however, the demand was for production not only of the best general composite, but at lightning speed to keep pace with the estimated possibilities of national aeroplane output. So, even with the clearest phase-cycle to work upon, the selection of the best features, above all the choice of those that would best harmonise with each other, must have been a matter of immense difficulty. And even with the choice definitely made, it is certain that the proportions of each part would have had to be re-cast from the original. So while it is clear that the stories as to 1,500 changes of detail may have been true in fact, the allegation is clearly false that they were changes in design; though in the circumstances, we should not be astonished if there were indeed so many, as mere dimensional changes. All the less, since swift production demanded fairly wide distribution on a global system among the specialists concerned; some of whose modelling, indeed, was incorporated in the new composite.

In detail we learn that the composition was thus made up:—

"Cylinder.—The designers of the cylinders for the Liberty engine followed the practice used in the German Mercedes, English Rolls-Royce, French Lorraine Dietrich, and Italian Isotta Fraschini before the war and during the war. The cylinders are made of steel inner shells, surrounded by pressed steel water jackets. The Packard company by long experiment had developed a method of applying these steel water jackets. The valve cages are drop forgings welded into the cylinder head. The principal departure from European practice is in the location of the holding-down flange, which is several inches above the mouth of the cylinder, and the unique method of manufacture evolved by the Cord company. The output is now approximately 1,700 cylinder forgings per day."

"Cam Shaft and Valve Mechanism Above Cylinder Heads.—The design of the above is based on the Mercedes, but was improved for automatic lubrication, without wasting oil by the Packard Motor Car Company."

"Cam Shaft Drive. The cam shaft drive was copied almost entirely from the Hall-Scott motor; in fact, several of the gears used in the first sample engines were supplied by the Hall-Scott Motor Car Company. This type of drive is used by Mercedes, Hispano-Suiza, and others."

"Angle Between Cylinders.—In the Liberty the included angle between the cylinders is 45 degrees; in all other existing 12-cylinder engines it is 60 degrees. This feature is new with the Liberty engine, and was adopted for the purpose of bringing each row of cylinders nearer the vertical and closer

together, so as to save width and head resistance. By the narrow angle greater strength is given to the crank case and vibration is reduced."

"Electric Generator and Ignition.—A Delco ignition system is used. It was especially designed for the Liberty engine, to save weight and to meet the special conditions due to firing 12 cylinders, with an included angle of 45 degrees."

"Pistons. The pistons of the Liberty engine are of Hall-Scott design."

"Connecting Rods.—Forked or straddle type connecting rods, first used on the French De Dion car and on the Cadillac motor car in this country, are used."

"Crank Shaft.—Crank shaft design followed the standard 12-cylinder practice, except as to oiling. Crank case follows standard practice. The 45 degree angle and the flange location on the cylinders made possible a very strong box section."

"Lubrication.—The first system of lubrication followed the German practice of using one pump to keep the crank case empty, delivering into an outside reservoir, and another pump to force oil under pressure to the main crank-shaft bearings. This lubrication system also followed the German practice in allowing the overflow in the main bearings to travel out the face of the crank cheeks to a scupper, which collected this excess for crank-pin lubrication. This is very economical in the use of oil and is still the standard German practice."

"The present system is similar to the first practice, except that the oil, while under pressure, is not only fed to main bearings, but through holes inside of crank cheeks to crank pins, instead of feeding these crank pins through scuppers. The difference between the two oiling systems consists of carrying oil for the crank pins through a hole inside the crank cheek, instead of up the outside face of the crank cheek."

"Propeller Hub.—The Hall-Scott propeller hub design was adapted to the power of the Liberty engine."

"Water Pump.—The Packard type of water pump was adapted to the Liberty."

"Carburettor.—A Carburettor was developed by the Zenith Company for the Liberty engine."

"Bore and Stroke.—The bore and stroke of the Liberty engine is 5 in. by 7 in., the same as the Hall-Scott A-5 and A-7 engines, and as in the Hall-Scott 12-cylinder engine."

"Remarks.—The Liberty 12-cylinder engine passed the 50 hour test, showing, as the official report of August 25th, 1917, records, 'that the fundamental construction is such that very satisfactory service, with a long life and high order of efficiency, will be given by this power plant, and that the design has passed from the experimental stage into the field of proven engines.'"

"An engine committee was organised informally, consisting of engineers and production managers of the Packard, Ford, Cadillac, Lincoln, Marmon, and Trego companies. This committee met at frequent intervals, and it is to this group of men that the final development of the Liberty engine is largely due."



# THE FLIGHT OF AN AEROPLANE AT DIFFERENT ALTITUDES.

By LOUIS DE BAZILLAC, Ingenieur (École Supérieure d'Aéronautique de Paris).

Translated by B. BRUCE-WALKER, B.Sc.

THE problem of the flight of the aeroplane at different altitudes can be solved analytically and graphically.

We will deal first of all with the analytical solution.

## I. Analytical Solution.

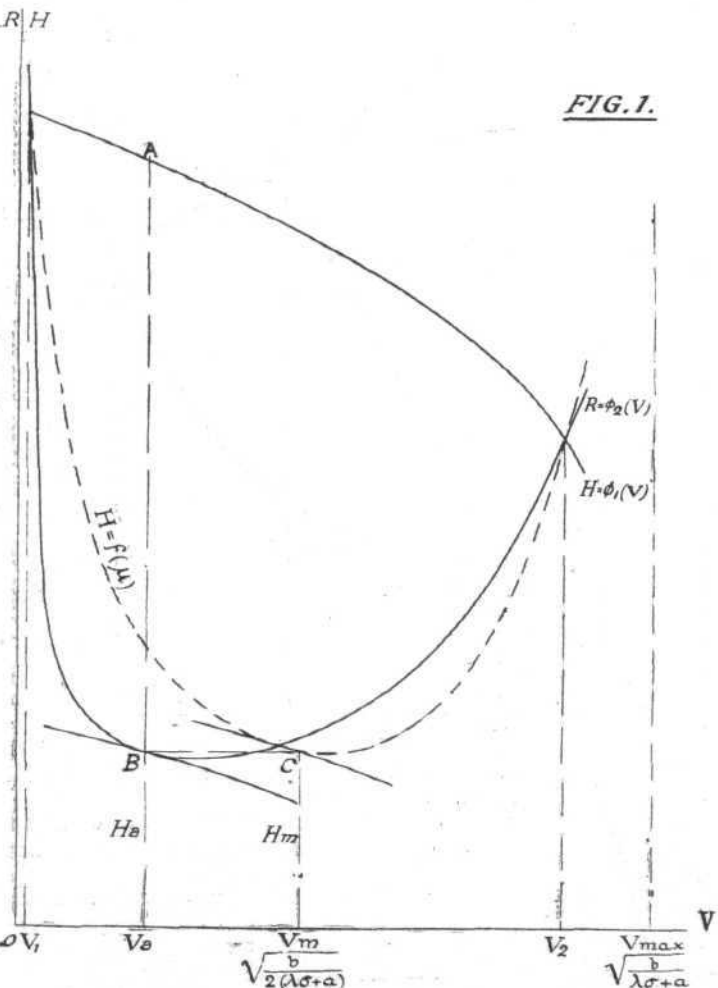
As aviators in practice use the barometer only for determining altitudes, we will bring into the following calculations neither the temperature of the air nor its hygrometric state, and will take alone as representing the barometric law the classical formula of Halley:—

$$Z = 60,370 \log \frac{P_0}{P}$$

which serves for testing height-measuring barometers, and in which  $Z$  is the altitude expressed in feet, and  $P$  the pressure indicated on the barometer at the point considered.

If we put  $\frac{P_0}{P} = \frac{1}{\mu}$  we know that  $\mu$  is proportional to the ratio of the densities of the air at the altitude  $Z$  and at sea level.

We know as well that, for bodies moving in air the opposing resistance of the fluid is to a first approximation proportional to the density; consequently all the classical coefficients used for aeroplane and propeller calculations, and established on the supposition that the barometric pressure equals  $P_0$ , will be to a first approximation multiplied by  $\mu$ .



This granted, the general formulæ of an aeroplane flying horizontally at an altitude at which the barometric pressure is  $P$ , are as follows:—

Let  $H$  be the thrust of the propeller.

$W$  the total weight of the aeroplane.

$S$  the total surface.

$R$  the resistance of the aeroplane to forward motion.

$K$  the coefficient of resistance of the wings.

$V$  the velocity of translation.

and  $\alpha$  the angle of attack of the imaginary plane of the wings (a plane in line with the wind when the lift is zero).

$\mu = \frac{P_0}{P}$  being characteristic of the altitude  $Z$ .

If it is admitted that the thrust of the propeller is reduced proportionally to the density of the air, we have

$$H = \mu(b - aV^2) \quad (1)$$

$b$  is such that,

$V_2$  being the normal speed of flight of the machine, and  $T_2$  its power measured in lbs. feet at zero altitude,

$$(b - aV_2^2)V_2 = T_2$$

$$\text{whence } b = \frac{T_2}{V_2} + aV_2^2 \quad (1')$$

$a$  keeps sensibly the same value for different propeller systems.

We have further

$$W = \mu KSV^2a;$$

or, putting  $KS = \lambda$

$$W = \mu \lambda V^2 a \quad (2)$$

$$R = \mu \lambda V^2 (\tau a^2 + \lambda a + \sigma + \tau a_1^2) \quad (3)$$

(See articles of September, 1914, and October, 1916.)

$\tau$  being a coefficient generally smaller than 1 for cambered surfaces, and  $\sigma$  a coefficient depending on the detrimental resistance.

Lastly, for horizontal flight at the altitude  $Z$ ,

$$H = R \quad (4)$$

$$Z = 60,370 \log \frac{1}{\mu} \quad (\text{barometric law}) \quad (5)$$

Equation (4) gives, after having put into (3) the values of (2),

$$\lambda \mu^2 [\lambda (\sigma + \tau a_1^2) + a] V^4 - \lambda \mu^2 b V^2 + W(\tau W + t) = 0 \quad (6)$$

whence  $V^2 = \frac{2[\lambda (\sigma + \tau a_1^2) + a]}{\lambda \mu^2}$

$$\pm \sqrt{\frac{b^2}{4[\lambda (\sigma + \tau a_1^2) + a]^2} - \frac{W(\tau W + t)}{\lambda \mu^2 [\lambda (\sigma + \tau a_1^2) + a]}} \quad (7)$$

$$\text{and } H = \mu(b - aV^2) = \mu \left[ b - a \left( \frac{b}{2[\lambda (\sigma + \tau a_1^2) + a]} \right) \right]$$

$$\pm \sqrt{\frac{b^2}{4[\lambda (\sigma + \tau a_1^2) + a]^2} - \frac{W(\tau W + t)}{\lambda \mu^2 [\lambda (\sigma + \tau a_1^2) + a]}} \quad (8)$$

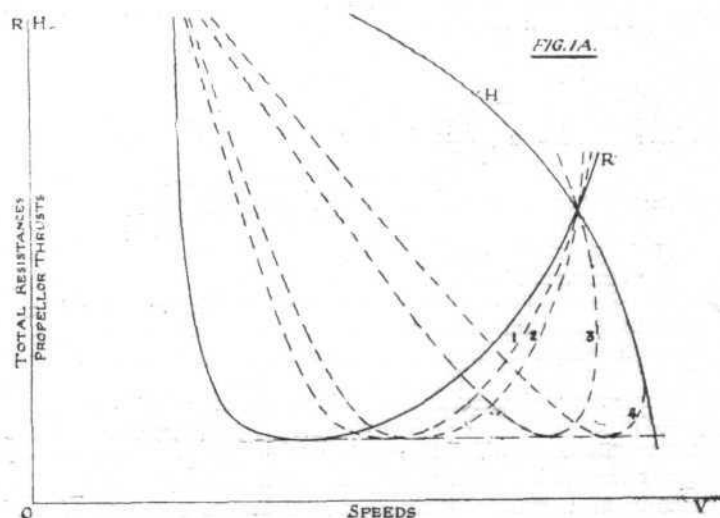
which give two positive values of  $V$  and two of  $H$  corresponding to them for each value of  $\mu$ .

The function  $H$  represents the locus of the points of intersection of  $H$  and  $R$  at different altitudes (Fig. 1).

The value of  $V$  for which these points of intersection are identical, is

$$V_m = \sqrt{\frac{b}{2[\lambda (\sigma + \tau a_1^2) + a]}} \quad (9)$$

$V_m$  is the speed of contact at the maximum altitude.



The corresponding value of  $H$  is then:—

$$H_m = \mu_m(b - aV_m^2) \quad (10)$$

where

$$\mu_m = \frac{2}{b} \sqrt{\frac{W(\tau W + t)[\lambda (\sigma + \tau a_1^2) + a]}{\lambda}} \quad (11)$$

$$\text{whence } H_m = [2\lambda (\sigma + \tau a_1^2) + a] \sqrt{\frac{W(\tau W + t)}{\lambda [\lambda (\sigma + \tau a_1^2) + a]}}$$

$H_m$  is the thrust of contact at the maximum altitude.

For  $\mu = 1$ ,  $H = b - aV^2$ ; the function  $H$  passes through the points whose abscissæ are  $V_1$  and  $V_2$ , which are the roots of equation (6) when  $\mu = 1$ .

Equation (6) gives :

$$\mu^2 = \frac{W(\tau W + t)}{\lambda V^2 \{b - [\lambda(\sigma + \tau a_1^2) + a]\}} \quad (12)$$

The condition for the values of  $\mu$  to be real is :—

$$V^2 \{b - [\lambda(\sigma + \tau a_1^2) + a]\} \geq 0$$

$$\text{i.e., } 0 \leq V \leq \sqrt{\frac{b}{\lambda(\sigma + \tau a_1^2) + a}}$$

These limits are those of the maximum and minimum speeds theoretically realisable.

The corresponding values of  $\mu$  are :—

$$\mu = \frac{W(\tau W + t)}{\lambda b^2(1 - 1)} = \infty.$$

It thus follows that the locus of the points for which the resistance to motion is equal to the thrust is a curve of parabolic nature with the concavity turned to the positive side of H. The ordinate  $H_m$  of this curve corresponds to the speed

$$V_m = \sqrt{\frac{b}{2[\lambda(\sigma + \tau a_1^2) + a]}}$$

The limbs of this curve pass through the points whose abscissae are  $V_1$  and  $V_2$  at zero altitude. They are asymptotic at infinity to the straight lines parallel to the axis :—

$$V = 0$$

$$\text{and } V = \sqrt{\frac{b}{\lambda\sigma + a}}$$

In order that the roots of equation (6) may be real it is necessary to have

$$\frac{b^2}{4[\lambda(\sigma + \tau a_1^2) + a]} - \frac{W(\tau W + t)}{\lambda \mu^2 [\lambda(\sigma + \tau a_1^2) + a]} \geq 0$$

$$\text{i.e., } \mu \geq \frac{2}{b} \sqrt{\frac{W(\tau W + t)[\lambda(\sigma + \tau a_1^2) + a]}{\lambda}}$$

The values of  $\mu$  are characteristic of the different altitudes. For a given altitude, we will thus have two values of V, and consequently of the angle of attack, that allow of horizontal flight. These values tend to approach each other more the higher one climbs, and become equal at the time when the aeroplane has attained its maximum altitude corresponding to the minimum of  $\mu$ . It is immediately apparent (Equation 12) that in a first approximation  $\mu$  is proportional to the total weight and inversely proportional to the product of the efficiency of the propeller and the motive power at zero altitude.

The maximum altitude attained is :—

$$Z_m = 60,370 \log \frac{1}{\mu_m}$$

For  $\mu = 1$ , i.e., at ground level,  $H = b - aV^2$ .

The points of intersection of H and R at ground level are given by Equation (6) when  $\mu = 1$ . The value of H for which the points of intersection are identical is :

$$H_d = b \left[ 1 - \frac{a}{2[\lambda(\sigma + \tau a_1^2) + a]} \right]$$

$$\text{where } b = 2 \sqrt{\frac{W(\tau W + t)[\lambda(\sigma + \tau a_1^2) + a]}{\lambda}}$$

$$\text{whence } H_d = [2\lambda(\sigma + \tau a_1^2) + a] \sqrt{\frac{W(\tau W + t)}{\lambda[\lambda(\sigma + \tau a_1^2) + a]}}$$

$H_d$  is the thrust of contact at zero altitude.

We see that  $H_m = H_d$ .

The thrusts of contact at zero and maximum altitude are therefore the same, and the locus of the thrusts of contact at different altitudes is a straight line, BC, parallel to the axis of V.

The thrust of contact at any height is then independent of  $\mu$ . This results in the following consequences :—

(1) The work done in moving from one point to another under the thrust of contact is independent of  $\mu$ .

Thus in a trial for distance or consumption, whatever may be the altitude adopted, for expending the same amount of work, the distance covered will be always the same at the speed of contact.

(2) The angle of attack corresponding to the speed of contact is independent of  $\mu$ .

We have also :—

$$V_d^2 = \mu_m V_m^2$$

and

$$V_d < V_m$$

It is clear, moreover, that  $V_m$  is smaller than  $V_2$ .

It will be seen that for an equal load carried, the speed  $V_2$  of rapid horizontal flight goes on decreasing as the altitude increases.

The maximum vertical speed is at any moment :—

$$U = \frac{[\mu(b - aV^2) - H_d]V}{W}$$

$$\text{where } b - aV^2 = b \left( 1 - \frac{a}{2[\lambda(\sigma + \tau a_1^2) + a]} \right) = \frac{b[2\lambda(\sigma + \tau a_1^2) + a]}{2[\lambda(\sigma + \tau a_1^2) + a]}$$

$$H_d = [2\lambda(\sigma + \tau a_1^2) + a] \sqrt{\frac{W(\tau W + t)}{\lambda[\lambda(\sigma + \tau a_1^2) + a]}}$$

$$V = \sqrt{\frac{b}{2[\lambda(\sigma + \tau a_1^2) + a]}}$$

$$\text{whence } U = [2\lambda(\sigma + \tau a_1^2) + a] \sqrt{\frac{b}{2[\lambda(\sigma + \tau a_1^2) + a]}} \left[ \frac{\mu b}{2\sqrt{W(\tau W + t)}} - \sqrt{\frac{[\lambda(\sigma + \tau a_1^2) + a]}{\lambda}} \right]$$

This speed vanished for :—

$$\mu = \frac{2}{b} \sqrt{\frac{W(\tau W + t)[\lambda(\sigma + \tau a_1^2) + a]}{\lambda}}$$

and we find again Equation (10).

If we express W as a function of V, the thrust of contact becomes

$$H_d = [2\lambda(\sigma + \tau a_1^2) + a]V^2$$

for zero altitude.

The locus of the thrusts of contact at zero altitude as the weight W varies, is then a parabola with the concavity turned

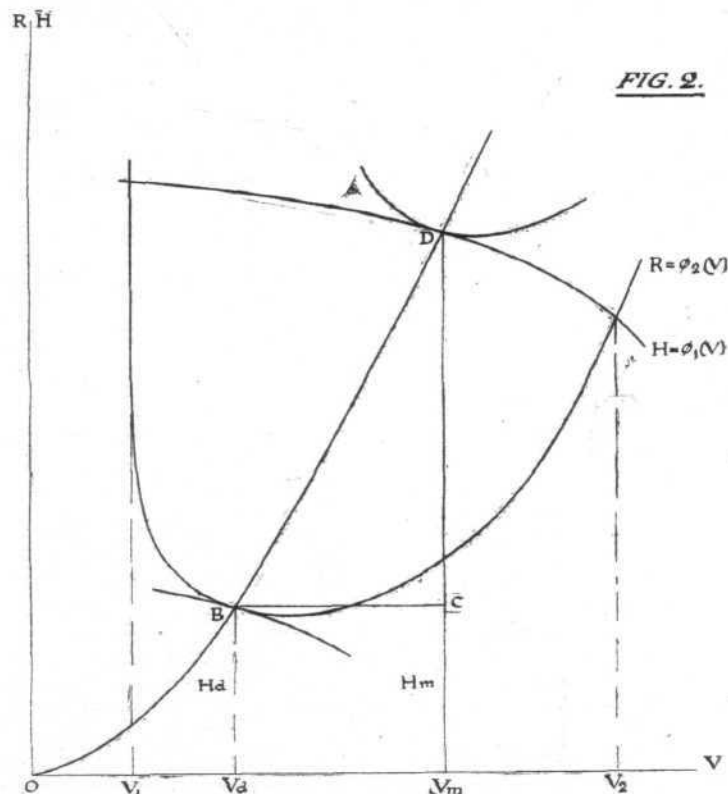


FIG. 2.

towards the positive side for H, with the axis vertical, and having its summit on the origin O.

Let D be the point of intersection of this curve with the curve of H, and V the corresponding speed ; it is clear that  $V = V_m$ .

Let us then denote by NW (Fig. 2) the weight of the aeroplane corresponding to the thrust of contact at the point D ; and let  $\alpha$  be the angle of attack, we have :—

$$NW = KSV^2 \alpha$$

$$W = \mu KSV^2 m \alpha.$$

The thrust of the propeller is, for W,

$$H = \mu \phi_1(V_m) = R,$$

and for NW,  $NR = \phi_1(V)$  ;

$$\text{whence } \frac{V^2}{V_m^2} = \frac{\phi_1(V)}{\phi_1(V_m)}, \text{ and } V = V_m.$$

The locus of the speeds of contact  $V_m$  is then a straight line  $V_m D$ , parallel to the axis of H, and passing through the point of intersection of the locus of the thrusts of contact and the curve of H.

It will then be seen that, with the aeroplane flying under the thrust of contact and the angle of attack remaining constant, the altitude increases, and the velocity remains constant so long as the weight decreases.

(To be continued.)



## A FULL DAY.

### III.—BEING SOME MORE ORDINARY INCIDENTS IN THE ORDINARY LIVES OF ORDINARY (AND SOME EXTRAORDINARY) PILOTS OF No. X SQUADRON.

TO-DAY has been a great day for the squadron. The Major has been away in hospital, so that I have been running the squadron, consequently not definitely tying myself up to fly on any special show. The morning had been "dud," but about mid-day the clouds cleared off, and the weather settled down clear and sunny for the rest of the day. I had arranged to fly down to see the C.O. of another squadron, whom I knew, but before I went, I "rushed off" six Camels to meet two artillery machines at 8,000 feet over a given spot, to escort them on a photographing work about four miles east of the lines on the La B— Canal.

I had engine trouble at No. — squadron, which prevented me getting back home till two-thirty.

As I stopped my engine in front of my shed one of my pilots held up eight of his ten fingers, and, while he nodded his head hard, a large grin suffused his face. If one pilot lands, and while he has been up some other pilot has got one or more Huns, it is always a sign to the pilot who is taxiing in that so many Huns (according to the number of fingers held up) have been knocked down while he has been up, when he sees a grinning face, a nodding head, and one or more fingers held up to him. In this case I thought someone was having a joke with me in their own quiet way, and it sent me all "naa-poo" when I heard the tail of the fight from W—, the leader of the escort.

He had met the three photographing machines at the rendezvous, the whole formation steering for the lines directly afterwards. The photography machines crossed at about 8,500, while he led his other five above and behind at about 9,500. W— had had a look out for Huns before he crossed the lines, but as far as he could see the sky was clear. The photography machines had just started the work, when about ten Huns hove in sight coming from the east, and above. Three of the Huns dived straight at the photographic machines, followed closely by all six Camels, which were in their turn followed by the remainder of the Hun formation. A general *melée* ensued between the Camels and the Huns, while the photographic machines were able to finish their work, get their photos, safely back to the lines, which was all important for them, and have a grand view of the fight. As one of their pilots said afterwards, "It was dangerous to be in the air because of falling Huns."

W— shot down one Hun out of control, which was attacking a photographic machine, and this Hun was seen to crash. He then got on the tail of another Albatros scout and fired a short burst into it at point-blank range. The Hun and his machine just disintegrated in mid-air in a cloud of white smoke, and an explosion, which everyone could hear above the roar of their engines. Each of the other five pilots shot down a Hun, all of which were crashed, and confirmed either by the anti-aircraft batteries, or the photographic machines. Some of these Huns went down side-slipping from side to side on their backs, others spun to earth, one fell in flames, while one wing came off another. L— shot one down which he could not watch crash, so, to ensure that it had, he came down to two hundred feet, "contour chased" round the spot, till he espied the wreckage lying in a heap on the ground, then "contour chased" back over the trenches.

These Huns all appeared to be inexperienced pilots with the exception of the red-nosed leader, who, however, was the one shot down and blown up in mid-air by W—. Of

those ten or so Huns six were completely destroyed, while two more were shot down out of control, and nearly certain to have crashed. Our total damage was half a dozen bullet holes distributed among our six machines.

The average Hun appears not to be keen on fighting, although there are, of course, exceptions, and, in my humble opinion, the Hun scout pilot of this time last year was in a different class to the average of this year. They now seem to aim at quantity not quality. As an instance of my statement, I will quote the following two cases. O— was a new pilot with no war experience. On his first job he lost his patrol, and for some time cruised up and down the trenches trying to find them. At last he saw six machines about four miles over the lines, which he thought must be his lost patrol. He cruised over into the middle of them quite happily, until he suddenly heard the rat-tat-tat of a machine-gun behind him. He swung round, and at the same moment realised he had run into the middle of six Hun scouts. O— was a sensible lad and kept his head. He knew it was hopeless to run for it, so he charged right at the nearest Hun, firing both his guns. The Hun turned over, spun down and was seen to crash by out A.A. batteries. He twisted and turned in the middle of the other five till he got down to 3,000 feet, when he put his machine into a spin, spun right down to 200 feet and "contour chased" back between the trees, followed by the five Huns above him as far as the trenches, the Huns not daring, however, to come down as low as he did, but keeping a respectful 500 feet above him.

The other incident was one of many adventures T— had before he went "West." T— was one of our flight commanders, a very gallant fellow and a great Hun straffer. Whenever he had no job on in the morning he would take his camel up to about seventeen thousand feet and wait for an unsuspecting Hun to come over our lines on a reconnaissance. On the particular day I am writing about, T— was doing his usual game, when he saw six Hun scouts dive on two of our artillery machines our side of the lines in the L— salient. Without a moment's hesitation he dived straight into the middle of them.

It was hopeless for him to try to sit on the tail of one Hun, as he would at once be leapt on by all the others. He wriggled, twisted, turned, and dodged, firing his guns when he could, and several times being in imminent danger of colliding with Huns. Meanwhile not only was the fight drifting east over the trenches, but another six Huns had joined in. The two artillery machines got safely away, but T— was still in the middle of what had now risen to a dozen Huns. There must have been so many that they got in each other's way, and baulked each other for shooting, for it was a miracle T— got away. If he had once hesitated for a moment, or tried to run away, he would have been lost. The Huns must have seen they were up against a tough proposition, for T— flew wonderfully at any time, and must have flown superhumanly on this occasion, for gradually he saw fewer and fewer Huns, until suddenly he found he had fought till there were no more Huns in the sky near him. He had no more ammunition, and he was four miles east of the lines. He flew back over the lines, made a priceless landing, and stepped out of his machine very nearly as calmly as when he went up.

H. B.

#### The Rent of the Agricultural Hall.

THE War Losses Commission heard on June 6th a claim made by the company which owns the Agricultural Hall for £19,589 as a year's compensation, and reserved its decision. Since it was taken over 13 months ago the R.F.C. have occupied the hall, and the company bases its claim on the letting value of the building. A surveyor appearing as a witness for the Government thought the hall as a whole unlettable for factory purposes at the amount claimed, and counsel for the Crown estimated a rent of £4,400 or £5,450.

#### The Wilbur Wright Lecture.

It is now announced that Sir William Weir, Secretary of State for the Royal Air Force, will take the chair on the occasion of the Sixth Wilbur Wright Memorial Lecture on June 25th. The meeting place is to be the Central Hall, Westminster, and Dr. W. P. Durand, Chairman of the U.S.

National Advisory Committee for Aeronautics, has chosen for his subject "Some Outstanding Problems in Aeronautics." Tickets can be obtained from the Aeronautical Society, 7, Albemarle Street, W. 1.

#### From Birmingham to South Africa.

In response to a request by Lord Desborough (the president of the Imperial Air Fleet Committee), the Lord Mayor of Birmingham (Alderman Brooks) has undertaken to raise a fund for the purpose of presenting an aeroplane to the Dominion of South Africa for service at the front. Contributions towards the £2,200 should be sent to the Lord Mayor at the Council House, and among the first contributions promised include £105 each from the Birmingham Small Arms Co., Electric Ordnance and Accessories Co., and Wolseley Motor Co.; and £52 10s. from Austin Motor Works.



"R.A.F." no longer clashes with the Royal Aircraft Factory. The latter is officially "R.A.E."—when translated, Royal Aircraft Establishment.

SIR JAMES BELL, the City of London Town Clerk, whose son, Capt. J. C. A. Bell, was one of the victims of the Huns' recent outrage upon hospitals, last week urged that the Government should forthwith take the only possible steps to stop this bombing of hospitals, viz., reprisals in kind. And in his advocacy he pointed out that in any event the Huns' practice, abominable as it was, carried with it military advantages, which we could hardly afford to leave entirely as a monopoly in the hands of the enemy. It was quite clear, Sir James said, that the Germans felt that as long as they bombed hospitals they got the advantage, because they were killing our officers, doctors, nurses and men. Unless reprisals were taken, not in any spirit of revenge, but simply as a military matter and a matter of common sense, those outrages would go on. Reprisals might take the form of bombing German hospitals and killing their wounded or putting German officers in all our hospitals everywhere near the Front. That would, in his opinion, stop the outrages.

LORD ROTHERMERE's great gift of organisation should find ample scope in his new post in America, where he will be in control of propaganda work. Whatever regret may have been felt at his resignation as Air Minister, it is a source for congratulation that he should be able to devote his remarkable talents to another such valuable outlet, in helping to win the war.

THE relation between the multiplication of flying machines and flying men and the future of the South African ostrich-feather industry, is not at once apparent, says the *British and South African Export Gazette*. Some little explanation is needed. It seems that there was recently exhibited at Grahamstown an airman's waistcoat, made of quilted satin and lined with short stock feathers. This waistcoat has been patented by the inventor, and is to serve as a model for others which are to be manufactured at Port Elizabeth. Here one may have the genesis of a new industry.

ADOLF SCHLESING, a repatriated German tailor's cutter, late of the Alexandra Palace, has, in his own interests, been lying pretty badly upon his arrival in his dear Fatherland. We had no personal knowledge of this romancer, but can well believe that he exhibited no particular hurry to rejoin his dear German friends at home, as it appears that he was "wanted" in a criminal sense by the German authorities. But once in for it he made the best of the job, and apparently having a better knowledge of Hun psychology than most of his higher placed compatriots have of the Allies' human side, he let himself go in pandering to their desires, as set forth in the following extract from the Berlin *Lokalanzeiger* of his case:—

"Further light was thrown on the sufferings of the interned Germans in London by the disclosures before the Central Penal Court of a tailor's cutter named Adolf Schlesing, who escaped from England only to be thrown into prison on his arrival in Germany as punishment for a crime he committed more than twenty years ago.

"Schlesing declared that the life of the Germans in the Alexandra Palace was a veritable hell on earth. The building has been chosen by the British authorities as a German internment camp for two reasons—first, because it was situated in the very heart of London; and, second, because it was at all times the target for Zeppelin and aeroplane attacks.

"Nevertheless, according to the prisoner's statements, the German civilians there herded together were specially preserved from the most frightful fate by a merciful Providence. Bombs fell in thousands in the immediate vicinity of the Alexandra Palace, entire streets full of houses were crushed into fragments, hundreds of English people were killed by the bombs, but not one German prisoner was ever hit or injured.

"The court, taking into consideration the prisoner's sufferings in the enemy country, discharged him."

How the above enumeration of woes and hardships can, however, be reconciled with the following, also taken from the same paper, it is not easy to follow:—

"The one sweet moment in our life of misery was when orders were given to put out the lights, for then we knew



*British Official.*

**ON THE BRITISH WESTERN FRONT IN FRANCE.—An observation flight over the German lines by our aeroplanes.**



that a German air raid was in progress. Notwithstanding that Alexandra Palace was deliberately selected by the English to be a target for German bombs, it has hitherto been spared, and our bombs have thus far fallen only on the English, not on their prisoners."

A MATTER of twenty fully-equipped aeroplanes, according to a cable message from Santiago, have been presented to Chili from Great Britain, and the local newspapers are brimming over with appreciation accordingly. As we want every fighter that can be made available, this side of the water, we hope the 'planes are of the school variety, so that they may be the means of sending us over a further few hundred pilots to take their place in helping to strafe the Hun, when the Allies' big air-strafe begins to materialise in earnest.

APPARENTLY, from reports, the Austrian Air Service is even more under the Allies' domination than is the German air offensive on the Western Front. Mr. G. Ward Price last week, in one of his communications from the Italian War Correspondents' Headquarters, in no measured terms confirms this. Mr. Price writes:—

"A bold daylight raid by a dozen British aeroplanes has caused considerable loss and disorganisation among Austrian billets up the Val d'Assa, the steep, dark and narrow gorge that comes down into the centre of the enemy positions opposite ours on the Asiago Plateau.

"Huts were seen to be struck and destroyed by bombs, and some of the raiding airmen, diving low, machine-gunned the traffic on the road that follows the gorge. Several motor lorries went crashing over the edge. The domination over the Austrian flying service by the Royal Air Force is shown by the fact that no counter-stroke has been attempted by enemy airmen."

THE experiments being conducted under French auspices, in regard to connecting up Paris and London postal services *via* the air, cannot but help forward this aspect of future aviation. Possibly nothing in this direction of an extensive character can be hoped for now, but the necessary data may thus by degrees be garnered in, so that when "the day" arrives the real thing may be got on with, with as little delay as may be. That mail carrying by post in various directions must come almost immediately a return to normal conditions is assured, is about as certain as the only other two usually accepted certainties—quarter-day and death. Therefore we congratulate the French pilots, Messrs. Heraldy and Lorgnat, at their missionary work in the service of aviation. In this connection, the general secretary of the French Postal Administration made the following statement to a representative of the *Petit Journal* on the subject of aerial posts: "We are still quite at the beginning of things. No aerial postal service has yet been started. We are studying several services, especially between Paris and Rome and Paris and London, but we have not yet obtained any definite

results. It will be necessary to employ a model embodying the characteristics of aeroplane and seaplane, and such a model is not yet altogether ready."

RECENTLY the Director of Naval Recruiting in Ireland, to wit, Lieut. J. C. Percy, R.N.V.R., had an opportunity of obtaining "impressions" of the Grand Fleet, and last week set out those impressions in his usual delightful way in *The Motor News*. Naturally the aerial side of our Grand Fleet was in evidence during this official visit, and Lieut. Percy gives his impressions of the "Aerial Army of the Navy," and the part it is likely to play, as follows:—

"After leaving the ——— we inspected the seaplanes and aeroplanes. In this department we saw much to comfort us. I thought I had kept myself in touch with every development in aviation, but the Navy, to use an Americanism, 'beats the band' by being right ahead of the procession. The exhibition of flying which was specially arranged for us was the finest I had ever seen. Aeroplanes tumbled about the sky like leaves in an autumn wind. They gave us demonstrations of all the 'stunts,' from 'side-slips' to 'looping-the-loop.' One of these machines must have 'loped' a dozen times. Rest assured, gentle reader, that the newest arm of the naval service is right up to yesterday, and 'aye ready' to play a noble part when the next sea battle comes. For getting off, speed, control and mastery of the air, the exhibition we witnessed left little or nothing to be desired. When the day of battle comes, as come it must, our naval airmen can be relied upon to prove themselves a gallant arm of the service to which they are now allied. This, at least, was the impression I carried away after witnessing what was to me a great and thrilling aerial display."

A CORRESPONDENT from India writes:—

"The value of aeroplanes on our India frontier has once again been demonstrated in the last few months. It was necessary to operate against the Marri tribe, who inhabit a jumble of hills covering an area of extraordinarily difficult country, about a third of the size of Belgium in Europe. Before the time of Lord Curzon's Viceroyalty, this would have meant a frontier war, and the employment of a force between 6,000 and 8,000 men at the least, the expenditure of many lakhs of rupees, and probably casualties in our ranks which might have been anything between 200 and 1,000. As has happened, there have been practically no casualties amongst the small force employed in the operations, and thanks to our aeroplanes the recalcitrant tribesmen were quickly reduced to a reasonable frame of mind with a minimum of bloodshed on their own. 'Unless we also learn to fly,' an old tribesman remarked, 'it's no good our trying to fight men who can fly like birds, and fire at us from the clouds, without giving us a chance to fire back again.' There is some truth in this, and for the sake of peace on British India's border line, it is to be hoped it may be generally recognised by all the wild tribes on our frontiers."



British Official.  
Major Raoul Lufberry, the American "Ace" of the American Expeditionary Force in France, who was shot down on May 19th at the American front, and his 'plane.

THE pain in little Willie's "underneath" must go unheeded now, for all the castor beans of India, Java, South Africa, Indo-China, the United States and Brazil are impounded to make the wheels go round.

The Department of Agriculture and the War Department in the United States are pushing the movement for a great increase in the production of the castor bean in the Southern States, in the hope that 200,000 acres may be planted in the present year; and the South is now being canvassed with the hope that the guaranteed prices will induce farmers to devote the requisite area to the production of this very necessary product up to the extent of £4,000,000 annually. It is stated that this oil is specially adapted to the peculiar lubricating conditions obtaining on the Liberty motor.

A SERVICE pilot in the making. *Being part of the conversation of an instructor through the one-way telephone fitted to most mono. school Avros:—*

"Can you hear me? Good! Now I want you to notice everything I do. I switch off, so, petrol on, petrol off." (The A.M. turns the engine over and asks for "Contact.")

"I switch on, and the engine will start when he swings it." (It does not.)

"It should start, swing it faster, man—some of these fellows we get now have no idea of prop. swinging.

"Something must be wrong, what are you doing with your switch in, there? It should be up, I have just told you so. No wonder she wouldn't start! Now keep clear of the controls and watch the joystick. I hold it well back into my stomach. Now I open the engine out and push the stick forward, so: now I gently draw it back a little. We're off.

"Feeling all right? Good!

"Now first of all I want you to feel the controls. Move the stick about a bit. Look out! You'll loop her, not so much, now she's side slipping; all right, I've got control.

"Now you have got the feel of the controls, we will try flying straight.

"Take control. Your right wing is low, now your left wing; don't jerk her so, don't be so heavy on the controls. Now she is swinging to the right. Too much rudder. Keep the cowl about a foot above the horizon. Watch your nose, it's going down; pull her up, up, man, pull the stick back! Let it alone, I've got control. That's the way so many pilots get broken. Now you must always work your controls together. Bank without rudder, and we side-slip, so, inward. Rudder without bank and we sideslip—outwards, so!

"Now we will try a gentle turn to the left. A little bank, a little rudder. Too much bank, do you want to roll her?

"Now try again. That's it. Now hold the bank off, off I said. That's right, keep her nose on the horizon. I didn't say come out of the turn. Now try again. Watch her

nose, not so much rudder, not so much bank. What are you doing, man? Let go, I've got control.

"Now we'll finish with a falling leaf. I pull her up, and up, and now full bank and opposite rudder so.

"You see, I have lost my prop. I do not get out on the skid and swing it, but put her nose down until we get enough speed to start the engine, so!

"Now I will show you how to land. I bring down gently and—what is possessing that fool to land in front of us? We'll have to go round again. Watch me zoom those girls ahead on the beach, go on, wave to them!

"Now I flatten out. I hold her off while she reduces speed, you see—ah! she did bump a little. There, almost a perfect landing.

"I wonder why she is heeling over a bit. Get out, will you, and see if they have sent me out with a flat tyre?

"What! it's burst? Well, this is a very rough 'drome, you know.

"Yes, you can wash out now."

## TEN YEARS AGO.

*Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of June, 1907. "FLIGHT" was founded at the latter end of 1908.*

ANOTHER "PASSENGER FLIGHT" BY MR. FARMAN.

The question of carrying a passenger on an aeroplane is one which has sprung into prominence with startling suddenness, and at a time, too, when practical aviators have but just succeeded in demonstrating that their machines are capable of flight at all. For the moment, the experiments in "passenger flight" have culminated in the winning of a wager, made with M. Charron, by Mr. Farman, who succeeded in carrying M. Archdeacon on his aeroplane for a distance of 1,241 metres.

M. DELAGRANGE BREAKS RECORDS AT ROME.

Following his comparatively brief flight of 2 kiloms., which we recorded in last week's issue, M. Delagrangé has had a run of success that has placed him a long way ahead of previous records. Early on Wednesday morning, May 27th, he executed an absolutely uninterrupted flight of about 10 kiloms. over the Piazz di d'Armi at Rome in the presence of the King and Queen of Italy, who arrived on the ground quite early to watch the trial, and were most enthusiastic over the result.

THE WRIGHTS TO FLY IN FRANCE.

Immediately following their accident, which resulted in the breaking up of the machine with which they were experimenting near Manteo, Mr. Wilbur Wright left for France, and has been inspecting a situation near Nantes with a view to deciding upon its suitability as a trial ground for demonstration flights.



British Official.  
A Cosmopolitan  
Group of Pilots in  
an R.A.F. Squad-  
ron on the British  
Western Front in  
France. — An  
American, Cana-  
dian, New Zea-  
lander, English-  
man, and South  
African.



# ANSWERS TO CORRESPONDENTS

## Notice to Correspondents in General.

FULL particulars regarding the conditions of service in the Royal Air Service were given in "FLIGHT" of April 11th.

Application to join as a cadet should be made in letter form, stating full personal particulars, to the R.A.F. Reception Depot which is nearest to the registered address of the applicant.

Applications for enlistment should be made personally or by letter, stating full particulars, including age and trade to the R.A.F. Reception Depot which is nearest to the registered address of the applicant.

Boys are enlisted from time to time for long service only. They should be Class A and between the ages of 15 and 17 years. Applications should be made as above.

No person is eligible for enlistment into the Royal Air Force unless he is a natural born British subject and the son of natural born British subjects.

The Royal Air Force Reception Depôts are:—

40, Upper Brook Street, Mayfair, London, W.1.

8, Tyndall's Park Road, Bristol.

12, Newport Road, Cardiff.

Carlton Chambers, Paradise Street, Birmingham.

Midland Bank Warehouse, King Street, Nottingham.

117, Mount Pleasant, Liverpool.

6, Portland Crescent, Leeds.

10, Sydenham Terrace, North Road, Newcastle-on-Tyne.

9, Somerset Place, Sauchiehall Street, Glasgow.

**S. W. (West Bromwich).**—It is quite possible, by putting the rudders over, for a twin-engined machine to fly with only one engine running. The machine will, of course, fly at a much reduced speed. We do not think this machine is now being used.

**H. C. P. (Coventry).**—We have published several illustrations of the machine you mention, and hope to publish others from time to time as opportunity occurs. We cannot promise to publish them in sets, however, as you appear to desire us to do. When flying "upside down" an aeroplane does not, as is frequently imagined, follow a horizontal flight path; but gradually loses altitude owing to the inefficiency of the wings when in the inverted position. The distance a machine can be flown in this position will vary very considerably according to the skill of the pilot, as the machine is, of course, unstable when upside down. Machines with a large dihedral are more difficult to fly this way than those with straight wings, other things being equal. There are no hard-and-fast rules for the use of wing flaps during a turn, some machines requiring to have the bank increased by means of the flaps, others having already a tendency to overbank and requiring to have the bank reduced by the flaps. Again some machines will automatically take up the correct bank for any turn without calling the wing flaps into play at all.

**C. H. S. (Hull).**—From the rough sketch you send us we cannot identify the machine. We are not permitted to publish figures relating to the performance of war machines, and so cannot inform you which of the two is the faster machine. We have never heard of a large flying boat of the type you mention looping the loop, and very much doubt whether it would be able to do so. At any rate it would be a risky proceeding. There is not, so far as we are aware, any difference. The two are synonymous.

**C. R. B. (Elham).**—The problems you mention are too lengthy to be dealt with in this column. We would refer you to the book entitled "Aeroplane Design," by Captain

Barnwell, R.A.F., a copy of which can be obtained from our offices. The price is 3s. post free.

**W. D. K. (Sanderstead).**—We are not permitted to give you the information asked for. This machine was probably a Maurice Farman "shorthorn."

**F. W. (Hanwell).**—Sopwith "Dolphin." The former machines have occasionally been fitted with the engines fitted as standard in the latter.

**H. R. (Exeter).**—We scarcely think that the "poor man's aeroplane" in days to come will be fitted with an engine of as low power as 9 h.p. Such a machine, although it could possibly be made to fly after a fashion, would have to be very frail to keep the weight low, and there would be little or no power in reserve for climbing. Also the speed would be so low, exactly what we cannot possibly say, but probably about 35 m.p.h., that the least bit of wind would prevent the owner from flying. It is dangerous to venture an opinion on the "popular" after-the-war machine, but we are inclined to think that it will be fitted with an engine of at least 25 h.p.

**P. F. D. (Muswell Hill).**—For the explanation of the initial letters of certain German makes of aeroplanes see our reply to G. B. H. B. in our issue of May 23rd. Neither of the machines you saw were, as far as we are able to judge, from your brief description, captured German machines.

**Gr. W. S. (A.-A. Gun Station).**—We regret that we do not recognise, from your description, the machine. De H. 4, S.E. 5a, Armstrong-Whitworth. In outward appearance the same as the B.E.2c, but has a curved fin and a different engine.

**B. F. Lt. (R.A.F.).**—The movement of the centre of pressure on an aerofoil need not be different when the machine is on a steep dive from that occurring when the aeroplane is flying level. To realise this clearly it should be remembered that the angle of incidence is not an arbitrary angle between the horizontal and the chord line, but is the angle formed by the chord line and the *direction of the relative air current*. Now even suppose that a machine is in a vertical position, with its nose pointing straight downwards. In this position the *flight path* of the aeroplane will not be vertical, but will be a sloping line, the slope being determined by the ratio of the resistance of the machine at this particular speed and the lift of the aerofoils. By lift, as the term is usually employed, is meant the *vertical* force on the aerofoil, but when the machine is in a vertical position the lift will be in a horizontal direction, causing the machine to follow a path forming an angle with the vertical. The angle of incidence need not therefore have changed, nor the centre of pressure. If the *flight path* were vertical, the machine would have to be partly on its back, in such a position; in fact, that there would be a *negative* angle between the chord line of the aerofoils and the flight path, corresponding to the angle of no lift, which, in a cambered aerofoil, is a negative angle, since even at 0 degrees incidence the cambered aerofoil still gives a certain amount of lift. As the resistance of an aeroplane is proportional to the density of the air, it follows that if a machine, designed for a certain speed at 15,000 ft., is flown at the same speed near the ground (this is scarcely possible in practice) there will be an increased stress on the structure. Flying in clouds or in a mist does not in itself impose greater stress than flying in ordinary atmosphere, but, owing to the difficulty of ascertaining whether or not his machine is on an even keel the pilot may easily subject his machine to greater stresses owing to too sudden variations in his flight path.

## How Lieutenant Fonck Fights.

SOME of the methods followed by Lieutenant Fonck, the leading French ace, have been disclosed by him in an interview. He believes in group formation for fighting as the time had gone for flying as an individual sport, such as it was practised at the start by Pegoud, Garros, Gilbert, Navarre, and even Guynemer and Nungesser. "The Germans," he says, "when they inaugurated group flying, taught us and unfortunately made us pay dearly for the lesson, of the dangers attending an effete method. But I am by no means a partisan of flying in over-big groups like that of the 'Richt-hofen circus.' I generally fly with two comrades—a group

of three'—and I am inclined to favour several groups of three sufficiently distant not to hinder each other's operations, but also sufficiently near to understand one another and give help at crucial moments. Too big a number may easily prove a peril, especially against a clever and daring enemy capable of practising the only tactics suited to the occasion, which is to throw himself into the middle of the group, paralyzing thus his adversaries, who can neither manœuvre nor fire from fear of injuring each other, whilst he, on the contrary, retains every facility of action. The Boches have had a bitter experience of this, as it was from a patrol of seven that I brought down my last three machines."



# TRADE PARLIAMENTS AND THEIR WORK.

By ERNEST J. P. BENN, Chairman Industrial Reconstruction Council.

## VIII.—SCIENCE AND EDUCATION.

So far, in building up the case for Trade Parliaments, I have dealt only with that portion of their work which may be described as reconstruction work—matters which will require to be settled the moment that hostilities cease, and which must consequently be studied well in advance. But when the reconstruction or transition period is over there will still be plenty of regular work left to occupy the energies and attention of Trade Parliaments. The subject of the relation of science to industry furnishes an excellent example of the need of co-operation between the various manufacturers engaged in a trade and between those manufacturers and the labour unions. There has recently been established a new Government Office known as the Department of Scientific and Industrial Research, which is charged with the duty of rendering such assistance as may be possible to industry.

During the two years of its existence this Department has already been inundated with requests for help and guidance on scientific problems arising in connection with various trades. The Department has already issued two annual reports which are full of interest for the student of industrial developments. They are, of course, particularly useful as a statement of the policy which the Government is pursuing in connection with this important question. A grant of a million sterling has been made for this purpose, and from this the Research Department is able to offer financial assistance on a *pro rata* scale. Progress has been so rapid that there are already seven research associations with articles in draft and approaching completion; ten others are beginning to draft articles, and eleven more trades are considering the formation of research associations.

As the first of the great industries to move in this direction we may take cotton as an example of the rest. A provisional committee of research and education for the cotton industry was formed by the trade, and has been at work for some time on the constitution of a cotton research association. In connection with the work of this Committee a series of articles appeared in the *Manchester Guardian*, which constitutes quite the best statement of the case for scientific research in industry that has yet been published. These articles attracted so much attention that the Committee arranged for their publication in pamphlet form, and this pamphlet is available at the offices of the Cotton Committee, 108, Deansgate, Manchester.

The cotton industry appears to have awakened to the fact that it is being carried on to-day exactly as it was fifty years ago, and that no improvements in machinery worth the name have been introduced since the days of Arkwright, and, worst of all, that neither masters nor operatives have between them any very great knowledge of the scientific properties of cotton or of the prospects of its increased cultivation or manufacture. What applies to cotton applies to almost every one of our trades. No industry can hope to prosper for long which is not supplied with a continual stream of new knowledge. Scientific research, as conducted by the Cotton Association, will be a very different thing from the sort of research that has hitherto been conducted in a small way by various enterprising manufacturers. To get the best out of research it needs to be conducted on a large scale. It is not suggested that there should be any interference with the manufacturer who keeps his own laboratory for the purpose of improving his information with regard to the details of his own business. But it is a fact that quite in addition to anything that can be done in this way

there is the need for the considered attention of the best scientific brains to the main problems of every trade. Every industry pays enormous sums of money for its fire insurance. One or two trades have been so impressed with the total amount spent in this way that they have thought it well to establish their own special insurance offices. Fire insurance is universally recognised as one of the necessary expenses of business, as manufacturers require to be assured that if they are overtaken by a serious fire they will be in a position to repair the damage. It is estimated that a sum far less than that spent upon fire insurance would provide each trade with an insurance that is far more necessary to it—an insurance against the risk that American laboratories or Japanese universities, or German technical skill will not one day rob the trade of everything it possesses. So urgent is this question of science and industry that the Scientific and Industrial Research Department is now occupied in promoting special research associations in most of the leading trades. The Department and the trades have all agreed that it is impossible to wait for the establishment of proper self-governing bodies, which could take over these functions. But it is obvious that if a complete system of trade self-government is evolved from the present discussions, then the research associations now being formed will become part of that system of government.

Education is another kindred subject with which little progress can be made until our trades get together and decide to tackle it. We spend to-day in one way and another something over £1,000,000 a week in education. Of this vast sum a proportion is expended on technical and trade education. There are many thousands of trade schools up and down the country. Every educational authority has arrangements of some sort for teaching the technique of the leading trades in its locality. Several of the modern universities have special departments of interest to particular trades. The Board of Education subsidise many hundreds of technical classes and technical institutes, and yet, with one solitary exception, there is no single case on record of any official connection between our trades and our technical education. It is perfectly true that most of these educational facilities are arranged by committees upon which so-called experts are invited to sit. Thus the Education Committee of one of the counties may invite the opinion of one or two leading electrical engineers in establishing classes for education in electrical theory and practice. But apart from this haphazard connection there is, as I have said, only one case of a trade as a trade taking any official interest in the boys and girls who are presently to form that trade. This solitary exception is the School of Mines at Trefoys, which is maintained by the mineowners and the miners. They have together consented to a levy upon every ton of coal produced in their district, and thus formed a fund out of which the School of Mines is carried on.

If our trades are to be fitted in the future to meet the competition of an educated and progressive world, they must obviously put their heads together and see that they are provided with a continuous supply of recruits specially fitted for the business of their lives. When that complete system of trade self-government for which some of us are pleading so earnestly is established upon a proper footing, each Trade Parliament will have powers to raise a levy for the purposes of education, and technical education will at last stand a chance of being of real service to our industries.

### The Flying Temperament.

LECTURING before the Institute of Public Health the other day on "The Health Aspects of Aeronautics," Major Martin W. Flack, of the Research Department of the Air Ministry, said that it was a constant strain to the human organism, and a very severe strain, to be able to go up in an atmosphere where oxygen is getting rare and to adapt the bodily needs to that condition.

Unless measures were taken for protection, or the airman was a superman, collapse would inevitably occur. It was the function of the air medical officer to look upon the pilots under his charge as human machines, to say whether they were fit to take the air, and to take steps to remove any signs of mental or physical distress. To this end he advocated a system of tests of the respiratory and other organs, which would enable a medical officer to tell whether a pilot was deteriorating or not. It was obvious that a pilot must have

good vision, good hearing, and good hands, but lung capacity was the most important consideration.

The successful pilot was generally a deep breather, who took in more oxygen per unit breath than the ordinary man, and was able to hold his breath longer. At the same time, what was known as the "flying temperament" would to a certain extent overcome physical disability, and one of their most famous airman was a man of diminutive stature. In ground training hardening exercises should be insisted upon, as there was no doubt that a man so hardened, sitting in light clothing, had a much smaller oxygen usage than one who had not undergone the treatment. Careful watching was necessary in regard to drinking and smoking, and mental distraction, such as gardening, was of the greatest importance.

The necessity of a flying medical officer being a specially trained man was emphasised by Sir W. Watson Cheyne, who presided.



# Personals

## Casualties.

CAPT. E. L. BENBOW, M.C., attached R.A.F. (Lieut., R.F.A.), who was killed in action on May 30th, was the son of Mr. J. Benbow, of La Mortola, Ventimiglia, Italy. He went to France on February 2nd, 1915, and served with his battery for about twelve months. He afterwards served as Observer with the Royal Flying Corps for eight months, then, qualifying as a pilot, did work for which he was decorated with the M.C. by the King at the Investiture in Hyde Park on June 2nd, 1917.

FLYING OFFICER LIEUT. JOHN HEADLAM, Scout Pilot, R.A.F., who was killed in action on May 30th, aged 19, was the eldest son of Mr. and Mrs. W. A. Headlam, Stakesby Road, Whitby, Yorks.

MAJOR HERBERT MUSGRAVE, D.S.O., Royal Engineers, who was killed in action on June 3rd was youngest son of the late Sir Anthony Musgrave, G.C.M.G., and of Lady Musgrave, of East Grinstead. He was born in May, 1876, and passed through Harrow and Woolwich into the Royal Engineers in March, 1896; he had promotion in March, 1899, was captain in March, 1905, and Major in October, 1914. Major Musgrave, who was a graduate of the Staff College, was employed with the South African Constabulary from June, 1901, to September, 1904, and was D.A.A. and Q.M.G. at Malta from August, 1908, to August, 1912. In the following year he entered the R.F.C., and in 1914 for a brief period he was Deputy Assistant Director of Military Aeronautics at the War Office. In February this year he was appointed a General Staff Officer (second grade). He had received the D.S.O. during the war. For service in South Africa (1899-1902) he had two mentions in despatches, and was awarded the Queen's and the King's medals with seven bars. Major Musgrave, who had been wounded early in the war, married in 1905 Georgeanna, only daughter of Mr. Mark Hopkins.

CAPT. W. G. PENDER, M.C., R.F.C., who was reported missing on August 15th, 1917, and has now been officially reported as killed on that date, was the eldest son of Mr. and Mrs. John Pender, of Onich, Great Bookham, Surrey. Born in 1886, he was educated at Dollar Academy, Scotland, where he distinguished himself as an athlete, being in the first XV. in 1903-1904 and 1904-1905. His play as three-quarter back was unexcelled in Scottish school football in these years. He was also champion long-distance runner in 1904 and 1905. On leaving school he studied engineering in Dundee, and in 1909 received the offer of an appointment in Rhodesia. On the outbreak of war he returned to England, and obtained his commission in the R.F.C. He quickly gained his wings, and saw much active service. He was noted as an extremely skilful pilot, and was awarded the Military Cross for conspicuous bravery in connection with the battle of the Somme. He was wounded in July, 1916, but insisted on remaining in hospital in France in order to rejoin his squadron at the earliest possible moment.

2ND LIEUT. CECIL IVOR PHILLIPS, Gloucestershire Regt., attached R.F.C., reported missing since October 27th, 1917, is now presumed to have been killed on that date. He was the eldest son of the Rev. E. I. A. Phillips, of 11, Pembroke Vale, Clifton, Bristol. He was educated at Clifton College and Sandhurst, and he went to France in the summer of 1917 as a fighting scout, and was shot down while escorting machines about 10 miles over the German lines.

2ND LIEUT. R. H. B. STEVENS, R.A.F., who was killed in action on May 30th, was the eldest son of Mr. H. M. Stevens, borough accountant at Brighton, and was another of the Old Boys of Brighton Grammar School who have made the supreme sacrifice in the war. Lieut. Stevens was only 18 years of age.

MISS BETTY STEVENSON, who was killed in an air raid on the night of May 30th, while on active service with the Y.M.C.A. at a base camp in France, aged 21, was the only daughter of Mr. and Mrs. Arthur Gavin Stevenson, of Grey Gables, Harrogate, and granddaughter of Mr. James Cochran Stevenson, M.P., of South Shields. She helped her mother at a canteen in France in 1916, and in 1917 she went to the base camp where she was killed. She was employed as a motor-car driver, and her special work was the care of the relatives of the dangerously wounded. Recently she had been helping in a Y.M.C.A. canteen, and on the day of her

death had been looking after French refugees. She was buried with military honours, as an officer of the British Army. She was known as "The Happy Warrior."

LIEUT. HARRY KENT CAPPER, R.A.F. and London Regt., who was killed on June 4th as the result of an accident while flying on the previous day, was the younger son of the Rev. O. F. Glanville, South Brent, Devon. He joined the Royal Flying Corps in January, 1913, from the 1st West India Regiment, in which he had served for eight years. He accompanied the British Expeditionary Force to France in August, 1914, as a member of the Royal Flying Corps. He had also seen service in Italy with the R.F.C.

CAPT. HUGH FANSHAWE GLANVILLE, R.A.F., who died on May 24th at Gullane, East Lothian, as the result of an accident while flying on the previous day, was the younger son of the Rev. O. F. Glanville, South Brent, Devon. He joined the Royal Flying Corps in January, 1913, from the 1st West India Regiment, in which he had served for eight years. He accompanied the British Expeditionary Force to France in August, 1914, as a member of the Royal Flying Corps. He had also seen service in Italy with the R.F.C.

CAPT. FRANK H. MACMASTER, R.A.F., who was accidentally killed on May 31st, whilst flying in Kent, was the second son of F. H. D. Macmaster, of Buenos Aires, and Mrs. Macmaster, of 58, Worple Road, Wimbledon.

LIEUT. BRIAN WILTON MEADWAY, Northants Regt. and R.A.F., who was killed on June 4th while flying in Hertfordshire, aged 22, was the only child of Minnie and the late G. H. Meadway, grandson of John Wilton, of Heathlands, Chadwell Heath, and great-grandson of George Wilton, of H.M.S. "Agamemnon," Trafalgar, 1805.

LIEUT. NORMAN RAMSAY MITCHELL, Royal Scots, attached R.A.F., who was killed on June 6th in a flying accident in Kent, aged 24, was the eldest son of the late Norman R. Mitchell, and of Mrs. Mitchell, 8, Blackford Avenue, Edinburgh.

CAPT. JOHN GORDON SMITH CHEETHAM HILL SMITH GRANT, Royal Scots, attached R.A.F., who is reported as having died of bomb wounds on May 30th, in a stationary hospital, France, was the eldest son of the late Col. George Smith Grant, "Minmore," Glenlivet. His age was 25 years.

CAPT. PETER DUDLEY STUART, R.A.F., Croix de Guerre, who was accidentally killed on June 1st while flying in Lincolnshire, aged 24, was the younger son of Mrs. E. K. Stuart and the late Dr. Peter Stuart, of Drummoyne, Blundellsands, and grandson of the late Peter Stuart, of Elm House, Seaforth, and of the late Henry Simpson, of Nottingham.

LIEUT. JOHN P. VAN RYNEVELD, R.F.C., who was accidentally killed on June 2nd while flying in Kent, aged 23, was the younger son of Mr. and Mrs. D. J. van Ryneveld, of Theunissen, Orange Free State, and brother of Lieut.-Col. H. A. van Ryneveld, R.A.F.

CAPT. WILLIAM ROBERT SARGENT WILBERFORCE, M.C., King's Royal Rifle Corps and R.A.F., who was accidentally killed while flying at Upavon, on June 2nd, was the younger son of the late Bishop of Chichester and Mrs. Ernest Wilberforce. Born in 1893, he was educated at Winchester, where he gained many athletic distinctions, winning the school steeplechase, and being a member of Commoner VI and the Association football team. On the outbreak of war he was given a commission in the 7th K.R.R.C., and served with the battalion in Flanders in 1915. On the recommendation of the Commander-in-Chief, B.E.F., he was granted a Regular commission in the K.R.R.C. in 1916, and later joined the R.F.C. Shortly after obtaining his pilot's certificate he proceeded to Egypt, and served continuously in Egypt and Palestine for 12 months, being present at the first battle of Gaza. For his bravery and devotion to duty he was awarded the Military Cross. In 1917 he returned to England, after suffering from fever in Palestine, and was employed as instructor and squadron commander up to the time of his death.

## Married:

MR. HERBERT JULIAN CARNDUFF, surviving son of the late Sir Herbert Carnduff, C.I.E., of Calcutta, and Lady Carnduff, of the Grey House, Meads, Eastbourne, was married on June 1st, at St. John's, Edinburgh, to NINA IRIS, younger daughter of Major WILLIAM GRAHAME-CHAMBERS, R.A.F.

LIEUT. SYDNEY DAVID CARPENTER, R.A.F., only son of Mr. and Mrs. D. J. Carpenter, of Waverley Park, London,



was married on Thursday, June 6th, at St. Matthew's Church, Bootle, by special licence, to NELLIE, younger daughter of Mr. and Mrs. W. DYSON, of Bootle, Liverpool.

CAPT. CHARLES COOK, R.A.F., was married on June 6th at St. Mary's Church, Weymouth, to EVELINE, only daughter of NORTON DISNEY.

The marriage arranged between FLIGHT-COMDR. FREDERICK MIDDLETON FOX, R.N., eldest son of Mr. and Mrs. Samuel Middleton Fox, Fawe Park, Keswick, Cumberland, and HELEN, eldest daughter of the late HOWARD CASE and Mrs. Case, Rochester, New York, U.S.A., took place on June 8th at St. Stephen's Church, Edinburgh.

### To be Married.

A marriage has been arranged, and will shortly take place, between MAJOR H. GORDON DEAN, York and Lancs. Regt., attached R.A.F., and HELEN MCNEILL, daughter of the Rev. John McNeill, of this country and America.

The marriage of CAPT. P. S. JACKSON-TAYLOR, Herefordshire Reg. and R.A.F., and JOYCE, daughter of Mrs. WEBSTER,

of 20, Rugby Mansions, W., will take place at St. Mary Abbot's, Kensington, on June 15th, at 2.30.

An engagement is announced between CAPT. G. E. F. SUTTON, M.C., R.A.F., and ENID MARY KATHLEEN, elder daughter of Mr. and Mrs. M. B. O'CONNOR, of Ballygunge, Calcutta, and of Ballygunge, St. George's Hill, Weybridge.

A marriage will shortly take place between Major L. PALMER, York and Lancaster Regiment, attached R.A.F., youngest son of Mrs. Palmer, Instow, Devon, and Miss LILLIAN WILLIAMS, youngest daughter of J. D. Williams, J.P., M.F.H., Clydach Court, Trealew, S. Wales.

The engagement is announced between MAJOR RALPH WHITEHEAD, R.A.F., eldest son of the late Arthur Whitehead, of Brindle Lodge, Houghton, Lancashire, and FANNY, only daughter of Cav. CARLOS BINDA and Signora Binda, of Milan, Italy.

### Items.

Gillingham Town Council have decided to confer the freedom of the borough upon CAPT. JAMES BYFORD MCCUDDEN, V.C., the airman, who is a native of the town.



## CORRESPONDENCE.

### Strength of Fokker Spars.

[1963] The writer of the interesting article on the above in your issue of May 30th makes certain assumptions, which may possibly mislead designers who have no facilities for full-size tests to destruction. The figures are a little difficult to follow, but the illustration clearly shows that the section considered is a box 7.9 ins. by 4 ins. overall, with 6-ply sides .1 in. thick, two 3-ply internal webs, presumably .05 in. thick, and four spruce flanges 2.1 ins. by .625 in. The writer assumes that the thin 6-ply top and bottom are able to act as additional flanges. Questions of horizontal shear and crippling naturally suggest themselves, and one would like to see the results of full-size tests.

The next assumption made is that "the section modulus of the flanges may be taken with sufficient accuracy as the area of the flanges multiplied by half the depth." He then, I think, adds together the modulus of the ply-wood box and of the flanges to obtain the modulus of the two. The only correct (and incidentally the easiest) method of ascertaining the Z of a compound section is to obtain the net sum of the I's of the various parts, and divide by the distance from neutral axis to extreme fibre. I think your readers will find that this gives a modulus for the whole spar of about  $10\frac{1}{2}$ , viz., about  $7\frac{1}{2}$  for the spruce and  $3\frac{1}{2}$  for the ply wood, or only about 65 per cent. of the modulus calculated.

To obtain the moment of resistance of the spar, the calculated modulus of 15.72 is then multiplied by 8,500. Is it

not a fact that the crippling stress of spruce is at most about 5,000 to 5,500? Its ultimate strength is immaterial. The moment of resistance of the spar would then appear to be about 50,500 to 58,000 lbs. instead of 133,790, as given, a somewhat significant testimony to the use of the usual methods of calculation. Few things are so vital at the moment as the exercise of all possible care in calculations for the strength of aeroplane members.

S.W.I.

P. J. W.

[We quite agree with our correspondent in what he says, and if the figures had appeared in an article intended to give instructive information in the calculation of stresses in spars they would admittedly have been inexcusable. Since, however, as was pointed out in the article, the object was only to make an approximate estimate of the strength of the Fokker spars, approximate methods were employed. As a matter of fact, the variation in loading along the span of the wing, and the support given to the top plane by the other two *via* the interplane struts, were disregarded, which fact in itself would probably give considerably greater variation from the true values of the bending moment, and consequently from the true factor of safety, than did the employment of approximate methods. As regards using the figure 8,500 for the strength of spruce, this is, we believe, the figure usually employed in stress calculations—at any rate, it is generally given in the various text-books.—ED.]

### Paris-London Aerial Post.

On June 7th Louis Heraldy and Marcel Lorgnat made a new attempt in connection with the experimental aerial mail between Paris and London, starting from Bezons ( $7\frac{1}{2}$  miles north-west of Paris) at 1.5 p.m., carrying about 660 lbs. of mails, and arriving in London at 3.50 p.m. They left again at 4.5 p.m., reaching Bezons at 6.40 p.m.

The next day the airmen Le Mercier and Ducroq made a trial flight from Paris to Lyons and back. Leaving Vincennes at 6.40 a.m., they reached Lyons at 11.15 a.m. They left Lyons at 1.20 p.m., and returned to Vincennes at 6.5 p.m.

### New York-Boston Aerial Post.

An American wireless message states that the aeroplane mail service between New York and Boston has been established. The first mail was carried to Boston in 3 hours 22 minutes.

### Raids on Paris.

THE following official *communiqué* was issued in Paris on June 4th:—

"Our observation posts having signalled the approach of enemy airmen on Paris, a warning was given at 10.54 p.m., and the 'All Clear' was sounded at 11.25 p.m. There is nothing to report."

The following official *communiqué* was issued on June 7th:

"An air raid warning was given at 11 o'clock last night. A group of 20 enemy machines crossed our lines and proceeded in the direction of Paris. Defence measures were immediately brought into action, and our anti-aircraft batteries put up a powerful barrage fire. Some bombs were dropped. One death and some cases of injury are reported,

in addition to some material damage. The 'All Clear' was sounded at 12.20 a.m."

### Seven Against Five.

ACCORDING to a telegram from Terschelling, in the fight on the evening of June 4th between seven German and five English seaplanes, one German machine burst into flames and fell in the water. An English machine descended and landed in Vlieland.

Another English machine, which two hours before the battle had descended in the sea owing to damage, was set on fire near the shore by the crew, consisting of three officers and two men, who sprang into the water and gained the shore. They were immediately interned.

### A Charge of Aeroplanes.

THE story of a thrilling aerial attack on a German column is told by Mr. Gordon D. Knox, the *Daily Express* correspondent at the French Front. On May 30th, he writes, the officer in command of an air squadron launched some 50 machines against an enemy column that was occupying over three miles of road. The charge of the aeroplanes was like a cavalry charge, and was delivered 10 or 20 yards above the level of the ground, a hail of machine-gun fire being poured on the column, and the aeroplanes only ceasing to harass it when it had been completely dispersed.

### London Raider Honoured.

INFORMATION received in Amsterdam states that Capt. Koehl, commanding a bombing squadron, has been awarded the medal *Pour le Mérite* by the Kaiser.

It is further stated that Koehl has taken part in most of the air raids on London and Paris, his luck pulling him through without injury.





# The British Air Services

"PER ARDUA AD ASTRA"



## The Royal Air Force.

London Gazette, June 4th.

The following temporary appointments are made at the Air Ministry:—  
**Staff Officers, 2nd Class.**—C. M. Carington, M.C. (Capt., Spec. List), and is granted a temp. commn. as Capt., and to be Temp. Maj. whilst so employed; April 1st. Maj. H. Elwell; May 17th.

The following temporary appointments are made:—  
**Brigadier-General, Administrative.**—And to be Temp. Brig.-Gen. whilst so employed:—Maj. (Temp. Col.) B. C. Fellows, from Col. i/C Admin.; Maj. (Temp. Col.) A. L. Godman, D.S.O., from Col. i/C Admin.; June 5th.

**Staff Officers, 2nd Class.**—And to be Temp. Maj. whilst so employed, if not already holding that rank:—Maj. A. R. Martin, Capt. T. J. North; April 24th. Lieut. (Temp. Capt.) J. S. Barnes, Capt. C. E. Foggin, Capt. J. H. C. Minchin, Capt. E. J. D. Routh, Capt. W. S. Scott, M.C., Lieut. (Temp. Capt.) H. St. G. Smallwood; May 21st.

**Staff Officers, 3rd Class.**—And to be Temp. Capt. whilst so employed, if not already holding that rank:—Lieut. (Temp. Capt.) F. Egerton, vice Capt. J. T. North; April 24th. Lieut. (Hon. Capt.) H. M. Goode, Capt. F. E. Hellyer, Lieut. (Temp. Capt.) H. D. Williams, M.C.; May 21st.

### Flying Branch.

To be Temp. Lieut.-Cols. whilst employed as Lieut.-Cols. (A. and S.):—Capt. (Temp. Maj.) V. Nicholl, D.S.C.; April 1st. Maj. C. E. Maude; May 22nd. Maj. H. Stanley-Adams, D.S.C.; May 28th, seniority April 17th.

Lieut. (Temp. Capt.) B. C. Windeler to be Temp. Maj. whilst employed as Maj. (K.B.); May 27th.

Lieuts. to be Temp. Capt. whilst employed as Capt. (A. and S.):—J. H. Simpson, from S.O.; April 1st. H. F. Lindo; April 15th. G. Andrews; April 29th. W. O. Boger, H. B. Maund; May 10th. R. M. Foster; May 15th. R. T. Barlow; May 17th. W. A. Tyrrell; May 18th. L. S. Kiggell; May 19th. O. C. Rusden; May 21st. G. Irving; May 22nd. E. F. Peacock; May 23rd. F. W. Deane; May 25th. F. A. Laughlin; May 26th. H. le R. Wallace; May 27th.

Lieut. D. C. Bauer to be Temp. Capt. whilst employed as Capt. (K.B.); May 17th.

Lieut. (Hon. Capt.) H. S. Scroggs to be Temp. Capt. whilst employed as Capt. (Dir.); May 20th.

2nd Lieuts. to be Temp. Capt. whilst employed as Capt. (A. and S.):—A. A. Leitch; May 20th. G. D. Horton; May 26th.

P. B. Williams, M.C. (Hants. Yeo. (T.F.)), is granted a temporary commn. as Lieut. whilst employed as Lieut. (K.B.); May 17th.

C. G. F. Carver to be 2nd Lieut. (K.B.), from 2nd Lieut. Admin.; April 29th. T./Lt. (Hon. Capt.) P. W. Brodie (Obs. Officer) to be T./Lt. (Hon. Capt.), A. and S.; April 2nd.

Temp. Lieuts. Obs. Officers, to be T./Lts. (A. and S.):—A. E. Woodbridge; April 3rd. H. W. Rick; April 5th. F. C. B. Greene; April 8th. D. H. King; April 12th. S. L. Shannon; April 20th. R. I. Dines, F. Yorke; April 21st. A. S. Rayner, G. Bliss, H. Rowbotham, J. McDonald, G. S. Morgan, B. H. Street, L. S. Brooke; April 22nd. G. S. Day, M. W. Richardson, J. F. Stallard, D. C. W. Sanders; April 25th. R. S. Rudd; April 30th.

T./2nd Lieuts. on prob., late Gen. List, R.F.C., to be Temp. 2nd Lieuts. (A. and S.):—A. Nugent; April 2nd. M. H. McErlean; April 5th. C. W. Jones; April 7th. G. G. Midgley; April 12th. H. H. Whitlock; April 17th. F. L. Le Lievre; April 18th. W. F. Washington; April 19th. J. C. H. Holmes, L. H. Weedon; April 20th. T. E. Simpson; April 22nd. J. L. Hill, J. T. Brown; April 23rd. K. S. Laurie, E. S. Housley; April 24th. D. Mallett, A. T. Williams, G. R. Iles, O. D. E. Hillsdon, R. Ridyard, E. R. A. Biggs, R. H. Dunn, D. Lewis; April 25th. G. C. Hope, J. W. Gray, G. W. Baguley, J. B. Holbrook, C. H. Bridge; April 26th. The following are granted temporary commissions as 2nd Lieuts. (A. and S.):—W. V. Trubshawe (T. Lieut., L'pool R.), and to be Hon. Lieut.; April 19th. W. H. A. Viscount Ipswich (Lieut., C. Gds.), and to be Hon. Lieut.; April 20th. T. J. Meredith (Lieut., Brit. Columbia R., C.E.F.), and to be Hon. Lieut.; April 23rd. C. F. Laxton (T. Lieut., attd. W. Yorks R.), and to be Hon. Lieut.; April 24th. T. Brandon, M.C. (T. 2nd Lieut., attd. Durh. L.I.); April 25th. F. F. McCulloch, M.C. (T. Lieut. Saskatchewan R.), and to be Hon. Lieut.; April 26th. The following are granted temporary commissions as 2nd Lieuts. (K.B.):—E. K. W. Denton (Temp. Lieut., R.A.F.), and to be Hon. Lieut.; April 1st. C. G. F. Carver (from Admin. Branch); April 29th. H. R. Watterson (2nd Lieut., R.G.A., S.R.), B. Miller, M.C. (2nd Lieut., R.G.A., S.R.); April 30th. E. E. Morgan, M.C. (2nd Lieut., R.G.A., S.R.); May 3rd. F. G. Taylor (2nd Lieut., R.G.A., S.R.); May 4th. J. O. Robson (T. Lieut., Lab. Corps), and to be Hon. Lieut. H. F. Birchall (T. 2nd Lieut., R.E.); May 5th.

The following are granted temp. commissions as 2nd Lieuts. (K.B.):—F. W. Smith (Lieut., S. Notts and Derby R., T.F.), and to be Hon. Lieut.; May 19th. R. H. Hampton (T. Lieut., R.E.), and to be Hon. Lieut.; May 20th.

T. 2nd Lieuts. (late Gen. List, R.F.C., on prob.) to be T. 2nd Lieuts. Obs. Officers:—J. B. Norton, A. J. H. Thornton; April 14th. E. N. Lohmeyer, D. G. Fraser; April 16th. J. A. Weatherley, H. Tannenbaum; April 17th. G. R. La Cecilia; April 18th. D. V. Crawley, H. Atkinson; April 20th. L. M. Thompson, E. R. Stewart; April 21st. E. B. Hyde, J. Harrison, F. G. Brown, B. Hall, J. A. Wilson, W. I. E. Lane; April 22nd. G. A. Cameron; April 25th.

The following are granted temporary commissions as 2nd Lieuts., Obs. Officers:—W. B. Ives (T. Lieut., A.S.C.), and to be Hon. Lieut.; April 14th. H. Stanners (T. 2nd Lieut., R. Muns. Fus.); April 15th. F. F. Hutchinson (Lieut., Lord Strathcona's Horse, C.E.F.), and to be Hon. Lieut.; G. H. Hobson (T. 2nd Lieut., North'd Fus.); E. V. Preston (2nd Lieut., W. Yorks R., T.F.); April 16th. H. B. Wilson (T. Capt., A.S.C.), and to be Hon. Capt.; R. K. Inches (Lieut., R.E.), and to be Hon. Lieut.; A. E. Cripps (T. 2nd Lieut., K.R.R.C.), F. C. Sawyer (2nd Lieut., E. Yorks R., T.F.); April 17th. D. Gardner, M.C. (Lieut., Dragoon Gds.), and to be Hon. Lieut.; G. N. Thomson (T. Lieut., High. L.I.), and to be Hon. Lieut.; April 18th. C. E. E. Boulton (T. 2nd Lieut., attd. Yorks. L.I.); April 19th. E. L. O'Leary (Lieut., C.F.A., C.E.F.), and to be Hon. Lieut.; T. J. Molony (Lieut., R.W. Kent R., S.R.), and to be Hon. Lieut.; T. B. M. Brown (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; A. Lomax (T. Lieut., R.F.A.), and to be Hon. Lieut.; A. R. A. Millar (T. 2nd Lieut., attd. S. Lancs. R.); B. Donald (2nd Lieut., Lond. R., T.F.); W. A. B. Buscarlet (2nd Lieut., R.G.A.); April 20th. C. W. Gladman (T. 2nd Lieut., R.W. Surr. R.); P. V. De la Cour (T. 2nd Lieut., S.A. Inf.); C. W. Davies (T. 2nd Lieut., R. Scots); W. I. Crawford (T. 2nd Lieut., attd. K.R.R.C.); W. G. Robins (2nd Lieut., Lond. R., T.F.); April 21st.

The following are granted temp. commissions as 2nd Lieuts. (Obs. Officers):—L. W. Edmonds, A. R. Levey, C. C. G. Ravine, W. Davies, C. A. Firmin, E. J. Richardson, J. Blair, F. C. Edney-Hayter, G. E. Izzard, J. E. Pritchard, A. N. Thomson; May 4th. G. Storey, J. F. Vickerton, T. Bailey, E. R. Beesley, C. G. Boothroyd, N. G. Breeze, H. O. Bryant, A. S. Draizey, C. F. R. Goodyear, J. Hills, J. C. Holmes, J. B. Leach, A. McKenzie, W. L. Woodhouse, J. A. Ottaway, S. J. Parkes, W. W. Pollard, G. E. Rochester, J. Y. Round, C. A. Sander, T. H. Souther, F. T. West, W. N. Hartley, L. J. Skinner, H. D. Travers, H. W. Batty, T. J. Bond, E. J. Bowen, T. E. Brewer, P. Davey, E. C. Fletcher, T. Hawkins, A. Hinder, R. S. Lipsett, G. E. D. Low, G. E. Little, J. Munro, J. F. J.

Peters, B. Rider, W. C. J. Rogers, E. Roberts, E. S. Sage, C. J. Tolman, W. R. Wright; May 18th.

Lieut. (Hon. Capt.) A. H. V. Fletcher resigns his commission on account of ill-health caused by wounds, and is granted the hon. rank of Capt.; June 5th.

Lieut. H. H. Tonks resigns his commission; June 5th.

2nd Lieut. A. R. Fairey resigns his commission, and is granted the hon. rank of 2nd Lieut.; June 5th.

The notification in the Gazette of May 21st regarding Lieut. (Temp. Capt.) A. R. Cox is cancelled.

The surnames of 2nd Lieuts. J. Aitken and G. F. Petch are as now described, and not as stated in the Gazette of May 21st.

### Administrative Branch.

R. M. Daniel (Temp. Maj.), R.G.A.) is granted a temp. commission as Maj., and to be Temp. Lieut.-Col. whilst employed as Admin. Lieut.-Col.; May 22nd.

Lieut. (Hon. Capt.) E. F. Monk to be Temp. Maj. whilst employed as Admin. Maj.; April 1st.

H. E. Talbot (Capt., 11th Hrs.) is granted a temp. commission as Capt.; May 9th.

A. Webb (Lieut., D. Gds.) is granted a temp. commission as Lieut., and to be Temp. Capt. whilst employed as Admin. Capt.; April 17th.

J. R. Croxford, and is granted a temp. commission as Lieut.; April 12th.

To be Temp. Lieuts. whilst employed as Admin. Lieuts.:—F. T. Court (Qmr. and Hon. Lieut., Gen. List), and is granted a temp. commission as Lieut.; May 20th. 2nd Lieut. A. W. B. Medhurst; May 21st. R. S. McGregor-Shepherd (Temp. Capt., Spec. List), and is granted a temp. commission as Lieut. (Hon. Capt.); May 22nd. R. J. Whitley (Temp. 2nd Lieut., R. Suss. R.), and is granted a temp. commission as 2nd Lieut.; May 23rd. 2nd Lieut. H. T. H. Copeland; May 27th.

L. Abraham to be Admin. Lieut. (from Observer Lieut.); May 10th.

The following are granted temp. commissions as 2nd Lieuts.:—A. G. Thomson (Lieut., E. Surr. R., T.F.), and to be Hon. Lieut.; April 2nd. J. Parker, Qmr. and Hon. Lieut., Trg. Res. Bn., and to be Hon. Lieut.; April 9th.

C. C. Clark (Capt., S.A. Pay Dept.) is granted a temp. commission as Lieut. (Admin.), and to be Hon. Capt.; April 6th.

Temp. 2nd Lieuts. (late Equipment Officers, 3rd Class, on prob., R.F.C.) are confirmed in their rank as Temp. 2nd Lieuts. (Admin.):—A. E. Simmonds, April 15th. R. Guy; April 17th.

A. W. Howard is granted a temp. commission as 2nd Lieut.; May 1st.

T. 2nd Lieuts. (late Equipment Officers, 3rd Class, on prob., R.F.C., Gen. List) are confirmed in their rank as T. 2nd Lieuts., Admin.:—F. Salmon; April 3rd. N. C. Raffin, R. D. Smith, E. S. Robson, G. R. Rankine; April 24th. W. R. Westland; May 11th. W. L. Eveleigh, A. K. Murray; May 16th.

The following are granted temp. commissions as 2nd Lieuts. (Admin.):—O. T. Moran (Capt., Canadian A.S.C.), and to be Hon. Capt. A. A. McLachlan, (Capt., Sea. Highrs.), and to be Hon. Capt.; R. Blackith (Q.M. and Hon. Lieut. Gen. List), and to be Hon. Lieut.; J. Ballie, M.C. (Lt., High. L.I., T.F.), and to be Hon. Lieut.; J. Cobley (Lieut., Midd'x. R., T.F.), and to be Hon. Lieut.; J. J. Galvin (Q.M. and Hon. Lieut., Gen. List), and to be Hon. Lieut.; R. O. O'Brien (Lieut., Training Res. Bn.), and to be Hon. Lieut.; T. W. A. Jackson (T. 2nd Lieut., A.S.C.); W. Yarwood (2nd Lieut., Manch. R., T.F.); E. R. Cox (T. Lieut., Wilts. R.); April 24th.

Lieut.-Col. G. W. S. Aldwell (Eng. Comdr., R.N.) relinquishes his commn. on account of ill-health contracted on active service; June 5th.

Capt. W. B. Hellard relinquishes his commission on account of ill-health contracted on active service, and is granted the hon. rank of Capt.; June 5th.

2nd Lieut. H. Bradley relinquishes his commission; May 15th.

2nd Lieuts. resign their commissions:—A. S. Hitching, C. W. McKissock; June 5th.

2nd Lieut. H. R. Donovan (2nd Lieut., R.A.) relinquishes his commission on account of ill-health contracted on active service; June 5th.

2nd Lieut. C. G. Hinder relinquishes his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut.; June 5th.

The following officers of the R.D.C. (T.F.) are granted temp. commissions as follows, dated May 14th:—As Lieut.-Col.: C. F. Campbell, C.I.E. As Capt.: C. G. Toswill, B. M. B. H. Gyll-Murray, R. C. Campbell, R. C. Bacon, W. F. Shakespear, R. S. C. de Chaffey. As Lieuts.: W. Rickets, H. F. Roberts, W. A. Dewhurst, J. R. M. Tweddell, J. R. Fox, H. H. Bunn, W. J. Hipkin, H. R. M. Dodd.

### Technical Branch.

Lieut.-Col. L. F. Blandy, D.S.O., is granted the temp. rank of Col. without the pay and allowances of that rank, while specially employed; May 21st.

To be Temp. Maj. while employed as Maj. (Tech.):—Lieut. (Temp. Capt.) F. G. Brown, Capt. F. R. Williams; May 20th.

P. Colbeck (Capt., N'land Fus.) is granted a temp. commission as Lieut. (Hon. Capt.) while employed as Lieut. (Tech.); May 20th.

Capt. (Temp. Maj.) A. E. Loxley reverts to the rank of Lieut. at his own request, and relinquishes the temp. rank of Maj.; May 20th.

2nd Lieuts. to be Temp. Lieuts. while employed as Lieuts. (Tech.):—E. H. Trump; April 5th. J. Smallbone; April 23rd. S. G. G. Ashley, J. N. Poyntz; May 1st. (Hon. Capt.) H. M. Fulton; May 11th. G. E. Bower; June 1st.

The following are granted temp. commissions as 2nd Lieuts.:—H. H. Mitchell (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; F. N. Newell-Roberts (A. Lieut., R.N.V.R.), and to be Hon. Lieut.; C. H. Welsh (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; H. W. Campion (Ft.-Lieut., R.N.A.S.), and to be Hon. Capt.; G. W. Robinson (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; H. Gray (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; April 13th. P. S. Burnay (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; W. M. Stace (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; E. G. Symonds (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; F. S. S. Calthorpe (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; C. A. Hurst (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; W. J. Metcalfe (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; G. Smart (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; G. Smart (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; C. E. Devas (Sub-Lieut., R.N.V.R.), and to be Hon. Lieut.; W. T. Kannar (Sub-Lieut., R.N.A.S.), and to be Hon. Lieut.; May 8th.

### Memoranda.

Maj. G. P. Grenfell, D.S.O., to be Temp. Lieut.-Col. without the pay and allowances of that rank while specially employed; May 29th.

D. W. Dawson, late 2nd Lieut., is granted the hon. rank of 2nd Lieut.; May 4th.

Lieutenants relinquish their commissions on ceasing to be employed:—J. Sturroek (2nd Lieut., Fife and Forfar Yeo.); April 20th. J. B. F. Austin (Lieut., Temp. Capt., Hrs.); May 22nd.

London Gazette, June 7th.

The following temporary appointments are made at the Air Ministry:—

**Staff Officers, 1st Class.**—Lieut.-Col. R. C. Donaldson-Hudson, D.S.O.; April 1st. Capt. (Temp. Maj.) R. Holloway, and to be Temp. Lieut.-Col. whilst so employed, vice Lieut. (Temp. Lieut.-Col.) R. W. Roynance; May 15th.

**Staff Officers, 2nd Class.**—And to be Temp. Maj. if not already holding that rank:—Capt. (Temp. Maj.) E. H. Cockburn; April 1st. (Substituted for



notification in the *Gazette* April 2nd.) Capt. H. K. Maxwell; May 5th. Lieut. (Temp. Capt.) P. C. Simmons, vice Lieut. (Temp. Maj.) H. P. Maybury; May 19th. 2nd Lieut. A. R. Fulton; May 20th. (Substituted for notification in the *Gazette*; May 28th.)

**Staff Officer, 3rd Class.**—Lieut. E. A. Mayner, and to be Temp. Capt., whilst so employed, vice Capt. (Temp. Maj.) C. R. Andrews; May 13th.

**Staff Officer, 4th Class.**—Lieut. H. D. Savory; May 13th.

The following temporary appointments are made:—  
**Staff Officer, 1st Class.**—Lieut. (Temp. Maj.) F. S. Isaac, and to be Temp. Lieut.-Col. whilst so employed; May 22nd.

**Staff Officers, 2nd Class.**—And to be Temp. Maj. if not already holding that rank. Lieut. (Temp. Capt.) W. L. Birch; April 1st. (Substituted for notification in the *Gazette* May 10th.) Capt. E. P. Stapleton; April 1st. Capt. C. C. Boyd-Rochfort; April 21st. Lieut. (Temp. Maj.) P. S. J. Owen, and to retain his temp. rank whilst so employed; May 23rd.

**Staff Officers, 3rd Class.**—And to be Temp. Capt. if not already holding that rank:—Lieut. G. H. A. Hawkins; April 1st. Lieut. (Temp. Capt.) G. W. Dobson; May 8th. Lieut. L. Tunks; May 14th. Lieut. A. H. King; May 15th.

## Flying Branch.

Capt. J. Everidge to be Temp. Maj. whilst employed as Maj. (A. and S.); May 23rd.

Lieut. (Temp. Capt.) S. O. Smith to be Temp. Maj. whilst employed as Maj. (K.B.); May 24th.

Lieuts. (Hon. Capt.) to be Temp. Capt. whilst employed as Capt. (A. and S.):—J. W. Pinder, May 13th; G. D. Smith, D.S.C., H. V. Worrall, May 21st; W. G. R. Hinchliffe, May 20th.

Lieuts. to be Temp. Capt. whilst employed as Capt. (A. and S.):—H. L. Rough; May 19th. D. Latimer, H. W. L. Saunders; May 25th. G. B. Bailey, H. C. Cooke, J. E. Middleton; May 29th. S. N. Pike; May 31st. H. C. Chambers; June 1st.

2nd Lieuts. to be Temp. Capt. whilst employed as Capt. (A. and S.):—J. A. Gray; May 26th. G. W. Bulmer; May 29th.

Temp. 2nd Lieuts. (late Gen. List, R.F.C., on probation) to be confirmed in their rank as Temp. 2nd Lieuts. (A. and S.):—A. N. Westergaard; April 6th. M. Tison; April 12th. E. H. Weatherall, H. M. Smith; April 13th. W. Dawson; April 21st. S. G. Groom; April 29th. H. Thomas, C. A. L. Coutts, R. Jones; May 2nd. N. C. Scott, B. Cohen, N. J. Nock, W. Allen; May 3rd. J. Cornyn, L. W. Pooley; May 4th. J. C. Joynt, P. Reed; May 5th. E. S. Farrand, A. S. Middleton, F. Stanley, I. B. M. McCulloch, L. R. Marsh, H. A. Morton, N. C. Waltho; May 6th. A. E. Parks, A. E. Brealey, R. G. Langmead, R. W. Barton, J. T. R. Proffitt, S. L. Horsman, C. W. G. McIntyre; May 7th. T. H. Pyke, G. Martin, W. M. Wormald, M. W. C. Ridgway, B. C. Kerr-Bayly, G. C. C. Carr-Harris, J. E. Watts, A. H. Bliss, H. J. L. Jones, J. Caldwell, L. Leeming, W. Dougall, J. S. Wheatcroft, A. K. Shuffelbotham, D. Stevenson, R. E. Stevens, F. H. N. Sessions, E. T. Treglow; May 8th. R. W. A. Watchorn, P. J. Bayly, J. G. Galbraith, C. F. Grant, G. Rowell, M. S. O'Rourke, W. B. Newth, O. M. Turnbull, W. W. Langdon, W. C. Goudie, J. V. Price, F. F. Anslow, L. A. Durrant; May 9th. M. McRobert, M. D. Sinclair, H. W. Burry, J. C. Dalton, G. S. Scott, H. J. Ewan, T. Allan, H. C. Curtis, P. C. Moymhan, A. C. New, J. Cameron, L. K. Davidson, W. Goffe, R. A. H. Brittain; May 10th. G. Norris, A. Wren, A. H. Fraser, H. J. Heddie, K. D. Handel, S. J. R. Smith, L. C. Pitts, T. H. Wright, C. S. Dunbar, R. N. Wellington; May 11th.

F. W. K. Davies, from Maj. (Tech.) to be Temp. 2nd Lieut. (A. and S.), and to be Hon. Maj.; May 10th.

Temp. Lieut. (Hon. Capt.) L. E. Barry (Obs. Officer), to be Temp. Lieut. (Hon. Capt.) A. and S.; May 6th.

Temp. Lieuts. (Obs. Officers) to be Temp. Lieuts. (A. and S.):—W. Adamson; May 8th. F. Leathley; May 11th.

The following are granted temp. commns. as 2nd Lieuts., A. and S.:—L. C. Rowney (Temp. Lieut., Midd'x R.), and to be Hon. Lieut.; May 1st. H. Gordon (Lieut., Ches. R.) (T.F.), and to be Hon. Lieut.; May 2nd. C. H. N. Ashlin (Lieut., E. Yorks. Yeo. (T.F.)), and to be Hon. Lieut. W. Wilson (2nd Lieut., L'pool R. (T.F.)); May 6th. W. Southworth (2nd Lieut., N. Lanc. R. (T.F.)); A. S. Wilcockson (Temp. 2nd Lieut., Midd'x R.); A. L. Pink (2nd Lieut., Rif. Brig.); J. Graham (Temp. 2nd Lieut., Res. R. of Cav.); T. W. Laybourne, D.C.M. (Lt., Saskatchewan R., C.E.F.), and to be Hon. Lieut.; May 8th. T. H. Langrishe (2nd Lieut., I. Gds.), A. C. Lobley (Lieut., E. Ontario R., C.E.F.), and to be Hon. Lieut., D. G. Williams (Temp. Lieut., Suff. R.), and to be Hon. Lieut.; May 9th. G. S. Tunstall (Lieut., Manitoba R., C.E.F.), and to be Hon. Lieut., T. Wishart (Temp. 2nd Lieut., attd. Gord. Highrs.); May 11th. T. M. Harries; June 1st. P. H. Bridges, A. R. Coppin; June 10th.

Temp. 2nd Lieuts. (late Gen. List, R.F.C., on prob.) to be confirmed in their rank as Temp. 2nd Lieuts., Obs. Officers:—H. M. Stewart; April 1st. N. Sillars; April 3rd. K. Preston, R. T. North; April 4th. R. Miller; April 6th. A. J. Ord; April 7th. S. H. Spencer, L. W. Jameson, E. Grayson; April 9th. G. N. Lloyd-Rees, J. J. Mackenzie; April 10th. F. A. L. Scar, L. W. Norman, W. K. J. Shirlaw; April 11th. C. Sunderland; April 12th. A. Fleming; April 13th.

The following are granted temp. commns. as 2nd Lieuts., Obs. Officers:—J. P. Y. Dickey (Lieut., Manch. R., T.F.), and to be Hon. Lieut.; April 1st. J. P. Jones (Temp. Lieut., S. Lancs R.), and to be Hon. Lieut., J. P. Bosman (2nd Lieut., R.F.A., S.R.), W. E. Barnes (Temp. 2nd Lieut., Notts and Derby R.), S. Parry (Temp. 2nd Lieut., R.E.); April 4th. A. H. Waddy (Lieut., Bedf. R.), and to be Hon. Lieut., C. E. Jenkinson (Lieut., R.F.A., S.R.), and to be Hon. Lieut., H. Haywood (Temp. 2nd Lieut., Oxf. and Bucks L.I.), F. Wood (Temp. 2nd Lieut., L'pool R.), P. V. G. Chambers (2nd Lieut., S. Staff. R., T.F.), H. G. Hooker (Temp. 2nd Lieut., Midd'x R.); April 5th. R. D. Stewart (2nd Lieut., S. Staff. R., T.F.); April 8th. T. F. Harvey (Lieut., Sea. Highrs., T.F.), and to be Hon. Lieut., G. Cuttle, M.C. (Lieut., R.F.A., S.R.), and to be Hon. Lieut., C. J. R. Gibson (Lieut., Cam'n Highrs., T.F.), and to be Hon. Lieut.; April 9th. F. E. Gauntlett (Temp. Lieut., R. Berks R.), and to be Hon. Lieut., A. E. Ansell (Lieut., Lond. R., T.F.), and to be Hon. Lieut.; W. Hodgkinson (2nd Lieut., L'pool R., T.F.), H. F. Lumb (Temp. 2nd Lieut., W. Riding R.), C. S. Bisset (2nd Lieut., E. Kent R., S.R.), W. F. Hanna (2nd Lieut., Cam'n Highrs., S.R.); April 10th. E. W. Collis (Lieut., Manch. R., T.F.), and to be Hon. Lieut., H. C. Kent (2nd Lieut., Cav., S.R.); April 11th. J. A. R. Andrews (Temp. 2nd Lieut., Linc. R.); April 12th. H. J. Greenwood, M.C. (2nd Lieut., W. Yorks R., T.F.); April 13th. H. V. Thornton (Lieut., Essex R., T.F.), and to be Hon. Lieut., April 20th. F. J. Lain (Lieut., Bord. R., T.F.), and to be Hon. Lieut., A. J. Rose (Temp. Lieut., attd. Worc. R.), and to be Hon. Lieut., F. H. Chapple (Temp. 2nd Lieut., Norf. R.), M. McConville, M.C. (Temp. 2nd Lieut., W. York R.), H. Gittins (Temp. 2nd Lieut., S. Lancs R.), N. Bowden (2nd Lieut., Notts and Derby R., T.F.); April 22nd. D. R. Sharnan, M.C. (Temp. Lieut., R. W. Surr. R.), and to be Hon. Lieut., C. H. Stilwell (Lieut., E. Surr. R.), and to be Hon. Lieut.; April 23rd. M. P. E. Harrison (2nd Lieut., E. Kent R.); April 24th. S. T. Jerome, M.C. (Temp. Lieut., R. Fus.), and to be Hon. Lieut., M. T. Stanley (2nd Lieut., Midd'x R., S.R.); April 25th. J. C. Howells (Lieut., Manch. R., T.F.), and to be Hon. Lieut.; April 26th. A. B. Mason (Maj., Nova Scotia R., C.E.F.), and to be Hon. Maj., F. Godfrey (Temp. Capt., Midd'x R.), and to be Hon. Capt., A. Mills (Temp. Lieut., Arg. and Suth'd Highrs.), and to be Hon. Lieut., N. A. Smith (Temp. Lieut., Manch. R.), and to be Hon. Lieut., R. W. Turner (Temp. 2nd Lieut., York. R.), G. C. T. Salter, M.C. (2nd Lieut., E. York R.), P. G.

Jones (Temp. 2nd Lieut., R.E.); April 27th. A. R. Evers (Lieut., Can. F.A., C.E.F.), and to be Hon. Lieut., C. H. Snow (Lieut., Nova Scotia R., C.E.F.), and to be Hon. Lieut., A. G. Fletcher (Temp. 2nd Lieut., R. War. R.), B. E. H. Whiteford, M.C. (2nd Lieut., R.F.A.) (S.R.); April 28th. F. H. Allchurch (Temp. Lieut., R. War. R.), and to be Hon. Lieut., R. P. Alday (Temp. Lieut., Shrops. L.I.), and to be Hon. Lieut., H. G. Scott (Temp. 2nd Lieut., Oxf. and Bucks L.I.), J. G. Angus (2nd Lieut., High. L.I., T.F.); April 29th. L. A. Naylor (Lieut., Nova Scotia R., C.E.F.), and to be Hon. Lieut., S. N. Bourne (Temp. Lieut., R. Suss. R.), and to be Hon. Lieut., I. R. L. Ross (Temp. 2nd Lieut., R. Ir. Rif.); April 30th. J. B. V. Clements (Temp. Lieut., R.F.A., and to be Hon. Lieut., E. W. Smith (2nd Lieut., Lond. R. (T.F.)); May 1st. J. A. G. Haslam (Lieut., R.F.A.), and to be Hon. Lieut.; May 2nd. C. Le G. Amy (Lieut., Saskatchewan R., C.E.F.), and to be Hon. Lieut., G. Thomson (Lieut., K.O. Sco. Bord.) (S.R.), and to be Hon. Lieut., A. G. H. Williamson (2nd Lieut., Norf. R.) (S.R.); May 4th. J. F. Glennie (Lieut., R.G.A.), and to be Hon. Lieut., R. P. Keely (2nd Lieut., Lond. R.) (T.F.); May 6th. A. M. F. Hill (Temp. Capt., K.R.R.C.), and to be Hon. Capt., H. F. Griffith (Temp. 2nd Lieut., Intelligence Corps), C. C. R. Millington (2nd Lieut., R.G.A.) (S.R.) E. C. Richards (Temp. 2nd Lieut., R.W. Surr. R.), W. J. Stockins (2nd Lieut., Lond. R.) (T.F.); May 7th. I. R. G. Jones (Capt., Welsh R.) (T.F.), and to be Hon. Capt., W. C. Broadwood (Lieut., Derby Yeo.) (T.F.), and to be Hon. Lieut.; May 8th. G. S. Grant (Temp. Capt., attd. Leic. R.), and to be Hon. Capt., H. S. Winkworth (Lieut., Dn. Gds.) (S.R.), and to be Hon. Lieut., L. C. D. Palmer (2nd Lieut., R.F.A.); May 9th. A. R. Watts, M.C. (Lieut., Cam'n Highrs.), and to be Hon. Lieut., T. C. Cooper, M.C. (Temp. 2nd Lieut., R. Lanc. R.), W. F. Nicholay, D.C.M. (2nd Lieut., E. York R.); May 10th. F. Ambler (Temp. Lieut., W. York R.), and to be Hon. Lieut., L. J. F. Oertling (Lieut., Bedf. R.) (T.F.), and to be Hon. Lieut.; W. S. Gregor (Temp. 2nd Lieut., High L.I.); May 11th. P. H. Dixon (2nd Lieut., R.F.A.) (S.R.); W. H. Stanley (Temp. 2nd Lieut., R. Fus.); May 12th. J. F. D. Tanqueray (Lieut., Canadian Engrs. C.E.F.), and to be Hon. Lieut., E. G. Pernet (Temp. Lieut., Bedf. R.), and to be Hon. Lieut.; T. C. Danby (2nd Lieut., York Hussars, Yeo.) (T.F.); H. L. B. Crabbe (2nd Lieut., Hussars); May 13th. L. G. Radcliffe (Temp. 2nd Lieut., Manch. R.); May 14th. W. H. Lyell (Lieut., Gord. Highrs.) (S.R.), and to be Hon. Lieut.; W. Miller (Lieut., Northd. Fus.), and to be Hon. Lieut.; G. J. Gaynor (2nd Lieut., S. Irish Horse Cav.) (S.R.); F. L. Norden (2nd Lieut., R. Scots); W. S. Chrystal (Temp. 2nd Lieut., attd. K.R.R.C.); May 15th. C. P. Domegan (2nd Lieut., R. Ir. Fus.) (S.R.); May 16th. R. M. Hall (Lieut., Quebec R., C.E.F.), and to be Hon. Lieut.; C. P. Harrison (Temp. Lieut., R.E.), and to be Hon. Lieut.; H. A. Lamb (Temp. Lieut., Res. R. of Cav.), and to be Hon. Lieut.; G. D. Dardis (Lieut., Can. Forestry Corps), and to be Hon. Lieut.; J. F. A. Hall (Lieut., E. York R.), and to be Hon. Lieut.; F. A. Shaw, M.C. (2nd Lieut., Lan. Fus.) (T.F.); F. W. Roadhouse (Temp. 2nd Lieut., York and Lan. R.); May 17th. J. H. M. Yeomans, M.C. (Lieut., N. Staff. R.) (T.F.), and to be Hon. Lieut.; A. J. Todd (2nd Lieut., N. Staff. R.) (T.F.); W. Spencer (2nd Lieut., Manch. R.) (S.R.); C. G. Gass (2nd Lieut., Lond. R.) (T.F.); H. E. Elsworth (Temp. 2nd Lieut., York and Lan. R.); May 18th. W. A. B. Eastwood (Temp. Lieut., E. York R.), and to be Hon. Lieut.; May 19th. R. L. Rice (Lieut., R. Dub. Fus.), and to be Hon. Lieut.; T. E. Elliott (2nd Lieut., Camb. R.) (T.F.); May 20th. G. R. Thornley (Lieut., Lan. Fus.) (S.R.), and to be Hon. Lieut.; C. F. Ambler (Temp. 2nd Lieut., R. Ir. Fus.); A. G. Lawe (2nd Lieut., Linc. R.); D. Boe (Temp. 2nd Lieut., Notts and Derby R.); May 21st. A. I. Williams (Lieut., Mon. R.) (T.F.), and to be Hon. Lieut.; J. Garrett (Lieut., Lord Strachcona's Horse, C.E.F.), and to be Hon. Lieut.; G. N. Sellers (Temp. 2nd Lieut., attd. W. York R.); May 22nd. T. Pim (Lieut., R.F.A.), and to be Hon. Lieut.; H. F. Gorman (Temp. Lieut., Hamps. R.), and to be Hon. Lieut.; C. V. Todman (Lieut., Lond. R.) (T.F.), and to be Hon. Lieut.; W. T. Ganter (2nd Lieut., R. Berks R.) (S.R.); E. H. Ralling (2nd Lieut., R.F.A.) (S.R.); J. E. Pilling (2nd Lieut., L'pool R.) (T.F.); M. G. Penny (2nd Lieut., R.G.A.); May 23rd. E. D. Spencer (Lieut., Can. Rly. Services, C.E.F.), and to be Hon. Lieut.; W. H. Delamere (2nd Lieut., L'pool R.) (T.F.); May 25th.

Temp. Lieut. (Hon. Capt.) F. T. R. Kempster (K.B.) to be Temp. Lieut., Obs. Officer, and to retain hon. rank as Capt.; May 1st.

Temp. 2nd Lieuts. (late Gen. List, R.F.C., on prob.) to be confirmed in their rank as Temp. 2nd Lieuts., Obs. Officers:—T. J. Wilson, J. A. Cogan; April 29th. J. A. Tomlinson; May 3rd. W. D. Davidson; May 4th. J. Lumsden, A. T. Sprangle, J. C. Fitton; May 6th. G. A. Drewitt; May 9th. G. E. Davies, J. W. Whitmarsh; May 11th. H. L. Page; May 13th. F. A. Gledhill; May 14th. W. R. Gray, T. W. Brockley, F. H. Perry; May 15th. D. R. Goudie, A. Taylor; May 17th. A. T. Streeter, L. C. J. Barlow, J. H. Umney; May 18th. H. Pullan; May 20th. A. H. Harrison, G. W. Elias, F. N. Brace, D. P. Conyngham; May 21st. W. A. Tagg; May 22nd. R. W. Brigstock May 23rd.

Temp. 2nd Lieut. H. G. Herbert (late Gen. List, R.F.C.), to be 2nd Lieut., Obs. Officer; April 28th.

The following cadets are granted temp. commissions as 2nd Lieuts. (Obs. Officers):—F. H. Foster; April 27th. F. Allen, S. J. West, L. F. Rowsell, W. Knowles, S. Chandler, L. Lastwood; May 23rd.

The following cadets are granted temp. commns. as 2nd Lieuts. (K.B.):—A. C. Blackburn, F. D. Wilkinson; May 13th. F. M. Grey; May 20th.

Lieut. R. J. Sawbridge relinquishes his commission on account of ill-health contracted on active service, and is granted the hon. rank of Lieut.; June 8th.

## Administrative Branch.

The following to be Temp. Maj. while employed as Admin. Maj.:—Lieut. (Hon. Capt.) L. C. Coates, Capt. W. G. Scott; April 1st. Capt. A. H. Parker; May 20th.

A. P. Frankland, D.S.O. (Maj., Res. of Off.), is granted a temp. commn. as Maj.; April 1st.

E. T. Chapman (Lieut., Lond. R., T.F.) is granted a temp. commn. as Lieut., and to be Temp. Maj. while employed as Admin. Maj.; April 1st.

Lieuts. to be Temp. Capt. while employed as Admin. Capt.:—J. E. H. Bibby, T. F. Davis, S. T. Grant; April 1st.

2nd Lieuts. to be Temp. Capt. while employed as Admin. Capt.:—G. I. Fry, J. W. Gardner, R. Tait, (Hon. Lieut.) G. E. L. Woodhouse; April 1st. S. Morris; April 29th.

F. K. Jones (Capt., Lond. R.) is granted a temp. commn. as Capt.; April 6th.

C. L. H. Dickinson (Lieut., Leic. R.) is granted a temp. commn. as Lieut., and to be Temp. Capt. while employed as Courts-martial Officer; May 7th.

2nd Lieuts. to be Temp. Lieuts. while employed as Admin. Lieuts.:—G. E. Smith; April 3rd. W. H. Botterill; May 18th.

K. Mackenzie to be Admin. Lieut., from A. and S. Lt.; April 9th.

G. C. Cheshire to be Admin. Lieut., from K.B. Lt.; May 15th.

R. T. Kelly (Temp. Lieut., L'pool R.) is granted a temp. commn. as Lieut.; April 1st. (Substituted for notification in *Gazette* May 17th.)

The following are granted temp. commns. as Lieuts.:—W. H. Charlton (Capt., North'd Fus.), and to be Hon. Capt., L. C. Russell (Temp. Lieut., R. Fus.); April 3rd. G. W. Rogers (Capt., N. Staffs. R.), and to be Hon. Capt.; April 6th. R. Godfrey (Lieut., Temp. Capt., R.G.A., T.F.), and to be Hon. Capt.; April 22nd. R. D. Bridgewater (Temp. Lieut., E. Surr. R.); April 24th. E. V. Bashford; May 2nd. B. A. Clay (Temp. Lieut., Res. R. of Cav.); May 11th. G. Malone (Lieut., R. Ir. Regt.), F. L. de Sales La Terrière; May 24th.

The following are granted temp. commns. as 2nd Lieuts. (Admin.):—F. Bentley, S. C. Bicknell, J. R. Bonnet, B. B. Brown, A. F. B. Cannon, L. V. E.



Charlton, W. F. Dean, A. B. Evans, J. S. Ferguson, R. E. Finch, J. S. Forde, W. H. Frame, C. W. Gordon, W. Haddon, R. Holland, F. C. Howe, H. T. Kay, S. W. D. Leake, J. E. Lewis, A. Lindsay, J. Mackay, E. Martin, J. R. McDonald, A. C. Merriel, H. T. Miles, I. B. Nelson, R. F. Nicholls, F. E. Openshaw, W. L. Oxley, D. T. Paine, J. W. Pegg, A. F. Potter, D. Rawley, B. L. Raymond, F. S. Read, J. Ross, W. Seed, N. W. Seyler, A. C. Smart, R. P. C. Taylor, W. E. Truman, R. V. Weeks, R. G. Wells, E. A. Williams, C. Wormleighton; May 22nd. H. Balls, W. E. Burdon, A. S. Crosby, J. A. Elliott, H. R. Moffatt, F. A. O'Brien, H. A. Read, H. W. Richardson, T. H. Storer, A. D. Watts, B. Williams, A. F. Wilson; June 1st. J. J. Evans; June 3rd. C. W. Edwards, N. J. S. Revington; June 5th. A. V. Scholes, F. C. Warren; June 6th.

Temp. 2nd Lieut. W. D. Littlewood, R.F.A., is granted a temp. commn. as 2nd Lieut.; April 7th.

H. M. Woodhouse, Lieut., Notts. Yeo. (T.F.), to be Temp. 2nd Lieut., and to be Hon. Lieut.; May 11th.

The following Temp. 2nd Lieuts. (late Equipment Officers, 3rd Class, Gen. List, R.F.C., on probation) are confirmed in rank as Temp. 2nd Lieuts. (Adm.): R. Carr, E. J. Crowe, A. J. Evans, A. M. Langdale, E. H. MacEnery; April 4th. J. E. Carter, F. A. Skoulding, H. E. Shaw, H. F. J. Taylor, H. E. Taylor; April 25th. A. J. Miller; April 26th.

Lieut. A. A. Vandyke (Lieut., Lond. R., T.F.) relinquishes his commn. on account of ill-health contracted on active service; June 8th.

#### Technical Branch.

Capt. H. A. P. Disney to be Temp. Lieut.-Col. while employed as as Lieut.-Col.; May 28th.

Capt. W. J. B. Curtis to be Temp. Maj. while employed as Maj.; April 1st.

2nd Lieut. E. C. Robinson to be Temp. Lieut. while employed as Lieut.; May 26th.

W. E. Jones to be 2nd Lieut. from Lieut. (A. and S.), and to be Hon. Lieut.; June 1st.

The following Temp. 2nd Lieut. (Admin.) to be Temp. 2nd Lieut. —A. J. Williamson; May 4th.

J. G. Russell (Capt., R. Sc. Fus., T.F.) is granted a temp. commn. as 2nd Lieut., and to be Hon. Capt.; May 18th.

2nd Lieut. F. C. Pratt resigns his commission; June 8th.

#### Medical Branch.

H. Pritchard (Temp. Maj., R.A.M.C.) is granted a temp. commn. as Maj.; May 2nd. (Substituted for notification in the *Gazette* May 28th).

The following are granted temp. commissions as Capt.:—J. MacGregor; May 23rd. E. H. Hogg, F. Rogerson; June 6th. W. L. Scott; June 10th.

The following are granted temp. commissions as Lieuts.:—G. Bourne, O. F. Conoley, L. C. Broughton-Head, G. H. Johnson, C. Murray-Shirreff, H. T. Prys-Jones, H. W. Toms, H. B. Troup; June 6th. R. T. Williams; June 7th. J. J. Savage; June 8th.

#### Memoranda.

Maj. (Temp. Lieut.-Col.) C. F. Lee to be Temp. Brig.-Gen. while specially employed; June 1st.

The following Lieut.-Cols. are granted the temp. rank of Colonel while specially employed:—R. H. C. Clark-Hall, R. C. S. Hunt; April 1st.

Lieut. J. Ferguson relinquishes his commission on ceasing to be employed; May 13th.

#### Royal Flying Corps (Military Wing).

*London Gazette Supplement, June 4th.*

The following appointments are made:—

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—G. S. Harvey; Dec. 12th, 1917. J. P. Murphy; Dec. 19th, 1917. W. F. Long; Jan. 24th. J. L. Mazucco; Feb. 8th. J. E. Robbins; Feb. 17th. E. G. Plum; March 2nd. C. G. V. Smith; March 4th. J. H. Farnham; March 14th.

**General List.**—Temp. 2nd Lieut. A. C. Stopher to be Temp. Lieut.; July 1st, 1917.

*London Gazette Supplement, June 5th.*

#### Schools of Instruction.—Schools of Military Aeronautics.

**Examining Officer** (Graded as a Flight Comdr.)—Rank and corps of 2nd Lieut. W. H. Dolphin, Ind. Army Res. of Officers, is as now described, and not as in *Gazette* of Jan. 11th.

**General List.**—Notification in *Gazette*, March 2nd, 1917, regarding following 2nd Lieuts, Ind. Army Res. of Officers, is cancelled:—W. H. Dolphin, F. O. Baxter.

*London Gazette Supplement, June 6th.*

**General List.**—To be Temp. 2nd Lieuts.:—Gnr. J. A. Moore, from H.A.C. (T.F.); Jan. 3rd. L.-Cpl. C. H. Philipps, from A. Cyclist Corps; Feb. 13th. Spr. R. C. Isles, from R.E.; Sgt. W. Molineaux, from Yeo. T.F.; Pte. (actg. Cpl.) W. L. Roblon, from A.S.C.; Feb. 14th. Cpl. W. Dixon, from R.A.M.C.; Pte. M. Dawson, from R.A.M.C.; Feb. 15th. Cpl. V. J. Clow, from A.S.C.; Feb. 16th. Gnr. C. A. White, from R.A.; Feb. 18th. Pte. F. W. E. Perry.

from A.S.C.; Gnr. H. C. W. Ross, from M.G. Corps (Motor); Sgt. H. L. Smith, from R.G.A.; L.-Sergt. F. G. Wells, from R. Suss. R. (T.F.); Feb. 19th. Cpl. T. M. Pratt, from Lond. R. (T.F.); Pte. R. Walker, from R.A.M.C.; Feb. 20th. Cpl. A. McKenzie, from Cam'n Highrs; Pte. J. R. McGregor, from A.S.C.; Pte. F. J. Taylor, from Devon. R. (T.F.); Feb. 21st.

To be Temp. 2nd Lieuts. (on prob.):—R. A. Caldwell; Feb. 17th. H. V. Fellowes; March 2nd.

*London Gazette Supplement, June 7th.*

The following appointments are made:—

**Flying Officers.**—Temp. 2nd Lieut. (on prob.) J. A. Moore, Gen. List, and to be confirmed in his rank; Feb. 28th.

The appointment of Temp. 2nd Lieut. J. D. Cook, Gen. List, notified in *Gazette* May 4th, is antedated to Jan. 21st.

The appointments of the following Temp. 2nd Lieuts., notified in *Gazette* May 2nd, are post-dated as follows:—L. R. Curtis to Jan. 23rd; F. D. Evans to Jan. 31st; R. H. Gast and W. B. Henderson to Feb. 11th.

**Flying Officer (Observer).**—Lieut. W. A. Milton, R.F.A., S.R.; March 20th with seniority from Feb. 8th.

**Special Appointment.**—(Graded as a Park Commander).—Temp. Lieut. (Temp. Capt.) J. Stewart, R. Sc. Fus., from a special appointment (graded as Equipment Officer, 1st Class), and to be Temp. Maj. whilst so employed; March 13th.

**Equipment Officers, 1st Class.**—Temp. Lieut. W. G. M. Nicholl, Gen. List, from the 2nd Class, and to be Temp. Capt. whilst so employed; March 1st.

**3rd Class.**—Capt. G. H. Green, R. Scots, T.F.; June 4th, 1917. Lieut. R. N. Goudge, Leic. R., S.R., from a Flying Officer; Oct. 30th, 1917. Temp. 2nd Lieut. H. Whittaker, Gen. List; Dec. 12th, 1917.

Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. F. M. Hopkins; Dec. 22nd, 1917. H. L. Copestake; Feb. 27th. G. L. Meehan; March 1st. A. F. Loveday; March 21st. F. A. Holmes; March 27th.

**Experimental Officer, 1st Class.**—(Graded as an Equipment Officer, 1st Class).—The appointment of Temp. Lieut. W. G. M. Nicholl, Gen. List, notified in *Gazette* of April 29th, is cancelled.

**General List.**—E. H. McEnery (late Lieut., Imperial Yeo.) to be Temp. 2nd Lieut. (on prob.); Dec. 28th, 1917.

*London Gazette Supplement, June 8th.*

**Flight Commander.**—The rank of Temp. Capt. G. E. F. Sutton, M.C., Canadian Local Forces, is now as described, and not as in the *Gazette* of Aug. 22nd, 1917.

The following appointments are made:—

**Flying Officers.**—Lieut. E. H. Millington, Ches. R. (T.F.), and to be sec'd.; March 27th. Lieut. S. B. Nelson, E. Ontario R., Canadian Exped. Force; Lieut. W. H. Whitlock, Devon R. (T.F.), and to be sec'd.; 2nd Lieut. F. E. Davy, R.F.A. (T.F.), and to be sec'd.; 2nd Lieut. B. Adie, R.W. Kent R. (T.F.), and to be sec'd.; March 28th. From Flying Officers (Obs.):—Capt. J. J. Lloyd Williams, M.C., Yeo. (T.F.), with seniority from Aug. 31st, 1917. Lieut. D. L. Burgess, M.C., Saskatchewan R., Can. Exped. Force, with seniority from May 31st, 1917; Temp. 2nd Lieut. A. S. J. Chapman, A.S.C., and to be transf'd. to R.F.C., Gen. List; Lieut. F. J. Gill, K.R. Rif. Corps, from a Flying Officer (Obs.); March 31st, with seniority from April 24th, 1917. March 30th.

Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—T. J. Young; Sept. 22nd, 1917. H. McD. Sinclair; Nov. 27th, 1917. J. J. Miller, D. M. Murray, H. S. Pelton; Dec. 19th, 1917. W. F. Leach; Dec. 24th, 1917. C. R. Wrede; Jan. 23rd. R. J. Donaldson, J. H. R. Bryant March 2nd. H. H. Birley; March 6th. L. St. Jean, W. H. Williams; March 9th. F. W. Messinger; March 16th. P. R. Beare; March 17th. S. Haydis; March 17th. F. E. Des Brisay; March 23rd. L. M. Mathewson; March 24th. A. E. Flynn, C. B. B. Cockman; March 27th. H. T. Allman; March 28th. R. D. de L. Miller; March 29th. G. A. Boast, J. W. A. Woodley, R. Sykes, B. V. Chinery, D. G. MacKenzie, H. A. Pike, C. G. Rich; March 31st.

The appointment of Temp. 2nd Lieut. T. W. L. Burke, Gen. List, notified in *Gazette* May 10th, is post-dated to Feb. 19th.

**Instructor in Gunnery.**—(Graded as an Equipment Officer, 1st Class).—The date of appointment of 2nd Lieut. P. H. R. Whittet, M.C., S.R., notified in the *Gazette* of May 11th, is March 24th, 1917.

**Equipment Officers, 2nd Class.**—Lieut. E. A. Rouch, Ind. Army, Res. of Off., from the 3rd Class; March 1st. Ormr. and Hon. Lieut. R. Hodge (3rd Class), E.O., from Gen. List, to be Temp. Lieut., Gen. List; March 30th. (Substituted for the notification in the *Gazette* of May 21st.)

**General List.**—2nd Lieut. G. Olivz to be Temp. Capt. while employed as a Section Comdr., Res. Depot; Jan. 15th.

To be Temp. Lieuts. (on prob.):—N. Kirkpatrick; March 24th. G. C. Macklem, N. F. Hoxie, C. A. Schiller; March 30th.

#### Aeronautical Inspection Department.

*London Gazette Supplement, June 4th.*

To be Temp. Hon. Lieuts.:—J. Kelly, while employed as Asst. Insp., Aero nautical Inspn. Dept.; Feb. 12th. Temp. Hon. 2nd Lieut. C. S. Williams; May 1st.

## AIRCRAFT WORK AT THE FRONT.

### OFFICIAL INFORMATION.

#### British.

"During the period, May 30th to June 2nd, inclusive, bombing raids have been carried out night and day on the following military objectives: Bruges Docks, Zeebrugge, Ostend. Several tons of heavy bombs were dropped on the objectives, with good results. Photographs confirm great damage at the large engineering works, Bruges. Thirteen enemy machines were brought down in flames and a further three driven down out of control. Three of our machines are missing. In Home Waters, during the above period, numerous anti-submarine and escort patrols were carried out, and long reconnaissances made across the North Sea. Submarines were sighted and attacked, and enemy mines were located on several occasions. During a North Sea patrol a Zeppelin was sighted and chased, but our seaplane was unable to get sufficiently near to engage her effectively. One of our seaplanes is missing."

#### General Headquarters, June 3rd.

"On the 2nd inst. our aeroplanes carried out a good deal of observation for the artillery, and took many photographs. Eighteen tons of bombs were dropped by our aeroplanes, and heavy machine-gun fire from the air was directed upon a great variety of targets. Eight German machines were destroyed in air fighting and 14 were driven down out of control. Three of our aeroplanes are missing. On the night of June 2nd-3rd we bombed Le Cateau, St. Quentin and Valenciennes railway stations, dropping 8 tons of bombs. All our night-flying machines returned safely."

#### War Office, June 4th.

"Italian Front.—Since May 25th the Royal Air Force has destroyed 14 enemy aeroplanes and driven one other down out of control. One of our machines has failed to return."

#### General Headquarters, June 4th.

"There was less activity in the air on June 3rd. Some reconnaissance and photographic work was carried out, and in the course of the following night a total of 18 tons of bombs was dropped by our aeroplanes. The targets chiefly

attacked by us were the railway stations of St. Quentin, Douai, and Luxemburg. Three hostile machines were brought down in air fighting, and one other was driven down out of control. None of our aeroplanes is missing."

#### General Headquarters, June 5th.

"The weather was overcast on the British front on June 4th, and aircraft were not active. One hostile machine was brought down by our aeroplanes, and another driven down out of control. One German balloon was destroyed. Beside reconnaissance work and artillery co-operation, we dropped during the day and the following night 14 tons of bombs. We lost no machines."

#### General Headquarters, June 6th.

"Fine weather on June 5th enabled our airmen to carry out much photographic, reconnaissance, and artillery work. Twenty tons of bombs were dropped on different targets, including hostile dumps, railways, billets, Armentières and Roye stations, and the Zeebrugge seaplane base. In addition, our long-distance day bombing machines heavily attacked the railway station and barracks at Trèves and the Metz-Sablon railway station, and the railways at Karthaus, returning without loss. Seven hostile machines and three German observation balloons were shot down during the day by our airmen, and three hostile aeroplanes were driven down out of control. Four of our machines are missing."

"On the night of the 5th-6th inst., 13 tons of bombs were dropped by us on St. Quentin, Busigny, Cambrai, and Armentières stations. All our machines returned. On the same night our long-distance bombing machines again attacked the Metz-Sablon station and triangle, and also the railway sidings at Thionville, dropping 5 tons of bombs with good results, although visibility was indifferent. On the morning of the 6th inst., the railway station at Coblenz was heavily attacked by us and good bursts were observed on the railway line. All machines engaged in these raids returned safely."

#### Admiralty, June 6th.

"During the period June 3rd to June 5th inclusive eight bombing raids



have been made on the following military objectives:—Zeebrugge, Ostend, Bruges, and Thourout railway junction. Large quantities of heavy bombs were dropped. In the course of aerial fighting two enemy machines were destroyed and three driven down out of control. One of our machines is missing. In home waters during the same period, escort duties and anti-submarine patrols have been carried out. Submarines were sighted, attacked, and enemy mines located on several occasions. A squadron of large seaplanes carried out a long reconnaissance over the North Sea. A large formation of hostile machines was met and engaged, resulting in two enemy machines being shot down. On the return journey two of our machines were forced to alight close to the Dutch coast, owing to engine trouble, and have been interned. The next-of-kin have been informed."

War Office, June 7th.

**Palestine Front.**—Activity during the past week has in general been confined to the operations of the Air Service. On May 31st, June 3rd and June 4th, the enemy camps, bivouacs and aerodrome in the vicinity of Amman (on the Hedjaz Railway) 25 miles east of the Jordan at the Ghoraniyeh bridgehead) were heavily bombed by Imperial and Australian squadrons.

General Headquarters, June 7th.

"Our airmen took advantage of the fine weather on the British front on June 6th to accomplish useful work in reconnaissance and photography, and, together with our balloons, ranged our guns on many hostile batteries. In air fighting, 14 German machines were destroyed and eight others were driven down out of control. Three German observation balloons were also destroyed by our airmen, and another hostile aeroplane was forced to descend by anti-aircraft fire. During the day we dropped 28 tons of bombs and a further 11 tons in the course of the following night. Amongst the targets attacked were Valenciennes, Le Cateau, Busigny, and St. Quentin railway stations. We lost one machine during the day and none at night."

General Headquarters, June 8th.

"In the air a good deal of observation and photographic work was carried out by us on June 7th. Bombing was active on both sides. We dropped 23 tons of bombs on railway junctions, aerodromes, and dumps beyond the German lines. Twelve enemy machines were brought down by our airmen and seven driven down out of control. We lost three machines. On the night of June 7th-8th no flying was possible.

"Low clouds on the British front interfered with work in the air on June 8th. Little photography or observation was possible, but our aeroplanes constantly attacked the enemy behind his lines with machine-gun fire. Our squadrons, co-operating with the French, heavily bombed Nesle and Fresnoy-les-Roye. In all, 9 tons of bombs were dropped during the day. During the following night 2 tons of bombs were dropped on Don railway station and Salome dump (east of La Bassée). In the course of the 24 hours four hostile machines were brought down by us and two others driven down out of control. None of our machines are missing."

**French.**

Paris, June 3rd.

"Our Air Force continued to display great activity during the days of June 1st and 2nd, carrying out, with its usual dash, its mission of reconnoitring, observation, and pursuit. Twenty-nine German aeroplanes were shot down and 24 driven down out of control and forced to land. In addition, four captive balloons were set on fire. Our bombing squadrons multiplied their expeditions on the whole zone of the battle front. One hundred and thirty tons of explosives were thrown on enemy convoys, troops, assembly centres and bivouacs, especially in the region of Crouy, Soissons, Vierzy, Villers-Helon, Neuilly-St. Front, La Fère-en-Tardenois, &c. During the days of June 1st and 2nd four other enemy machines were destroyed by anti-aircraft fire."

"**Salonica.**—Allied airmen dropped over 5 tons of explosives on the railway stations in the Vardar valley and on the enemy's camps north of Huma and East of Seres. North-west of Doiran three British machines attacked 12 enemy monoplanes and shot down four, two of which fell in flames."

Paris, June 4th.

"During the day of the 3rd, our bombing squadrons, while forcing their way into the enemy's lines, shot down two enemy aeroplanes. Three other aeroplanes and two captive balloons were shot down by our chasing squadrons. During the same day 21 tons of projectiles were dropped on troops on the march,

artillery columns, and supply transports. During the night of June 3rd-4th, 28 tons were dropped on the same objectives."

Paris, June 5th.

"**Salonica.**—Allied airmen have bombarded encampments east of Seres and north of Huma. An enemy machine was forced to descend, damaged, north-west of Ghevgehi."

Paris, June 6th.

"Yesterday, 19 enemy aeroplanes were brought down or forced to land disabled. A captive German balloon was set on fire. The same day and during the following night 25 tons of explosives were dropped by our bombing squadrons on cantonments, depôts, stations, and convoys in the enemy zone. A great conflagration, followed by explosions, was observed in the station of Fere-en-Tardenois."

Paris, June 7th.

"During the day of June 6th our pilots shot down or put out of action 13 German aeroplanes, and set fire to four captive balloons. Our bombing machines carried out a number of expeditions against the region of Roye, St. Quentin, Soissons, &c. Twenty-seven tons of explosives were dropped, and a number of fires could be observed in the places bombed."

**U.S.A.**

Paris, June 3rd.

"At a number of points there were air combats, in which our airmen shot down a hostile machine. One of our aeroplanes is missing."

**Belgian.**

Havre, June 5th.

"Flight Sub-Lieutenant Coppens shot down a German balloon south of Zarren. This is the fifth balloon set on fire by this airman in the last three weeks."

Havre, June 7th.

"To-night German aeroplanes dropped bombs on some of our cantonments. One of the enemy machines was shot down in the region of Adinkerke by our anti-aircraft guns and its occupants made prisoners."

Havre, June 9th.

"Second Lieutenant Coppens brought down his sixth balloon, thus bringing the number of his aerial victories up to seven in a month."

**Italian.**

Rome, June 3rd.

"There was considerable aerial activity on both sides. One hostile machine was brought down."

Rome, June 5th.

"Accurate shoots of our batteries caused fires and explosions here and there in the enemy lines, and brought down a captive balloon in flames on the left bank of the Piave."

"On the evening of the 3rd inst. four enemy aeroplanes were brought down."

Rome, June 7th.

"Aeroplanes and airships bombarded with more than 5 tons of bombs enemy aviation camps in the Venetian Plain, the railway station of Mezzocorona (north of Trent), and columns on the march on the Quero-Fenere road."

Rome, June 8th.

"The enemy's aviation camp between the Piave and the Livenza and the railway station of Caldonazzo (Brenta Valley, 12 miles south-east of Trent), surprised while in full activity, were effectively bombarded by our aeroplanes and airships. In fighting 10 enemy machines were brought down."

**German.**

Berlin, June 3rd.

"The railways leading towards the battlefield, which were strongly congested by the movements of troops, were successfully attacked by our bombing squadrons. We shot down 31 enemy aeroplanes. Lieut. Meckhoff achieved his 29th and 30th aerial victories; Lieuts. Loewenhardt and Udet their 25th."

Berlin, June 5th.

"Lieutenant Loewenhardt achieved his 26th aerial victory."

Berlin, June 6th.

"During the last two days, 46 enemy aeroplanes and four captive balloons have been brought down. The Richthofen chasing squadron shot down 15 enemy aeroplanes yesterday. Captain Berthold and Lieutenant Meckhoff obtained their 31st, Lieutenant Loewenhardt his 27th, Lieutenant Udet his 26th, and Lieutenant Kirstein his 21st and 22nd victory in the air."

## AVIATION IN PARLIAMENT.

### Royal Air Force and Dependants' Pensions.

MR. JOYNSON-HICKS, in the House of Commons on June 3rd, asked the Under-Secretary of State to the Air Ministry what pension, respectively, would be paid to the widow and child of a flight-cadet killed during training in this country and of a flight-lieutenant killed while training a cadet in this country?

MR. HODGE: The widow of a flight-lieutenant killed on flying duty received a gratuity of £140 and a gratuity of one-third of that amount for the child, together with a pension of £100 and a child's allowance of £24. I am in communication with the Air Ministry with reference to the grants appropriate to the family of a flight-cadet, and will inform the hon. member further on that subject in due course.

### Air Raid Insurance.

SIR H. NIELD asked the President of the Board of Trade (1) whether his attention has been called to the attitude of the officials who represent the Government in relation to the adjustment and settlement of claims arising under Government policies of insurance against damage by hostile aircraft or by anti-aircraft guns; whether his attention has been called to the allegation that there is a growing unwillingness on the part of the Government Department charged with providing compensation to air-raid sufferers to act up to the full measure of its responsibility; and whether he will cause an enquiry to be made into the matter generally; and (2) whether he is aware that allegations of harsh and overbearing conduct have been made against those officials who have the adjustment and settlement of claims under aircraft insurance policies issued by or on behalf of the Government; that legal objections are pressed, rights overridden, and current values of labour or materials ignored with the object of reducing the compensation to a minimum; whether a claim made by Mr. A. J. Frazer, in or about February last, for £250 was the subject of an offer of £85 only, though no allegation of excessive claim has or could be suggested; and whether it is the practice in these cases for the Government, where claims are carried into Court, to rely upon the rule that costs cannot be given against the Crown?

SIR A. STANLEY: I am unaware of any such general grievances as those referred to in the two questions. No cases have up to the present been taken into the Courts, and, in comparison with the number of claims settled under the aircraft insurance scheme, exceedingly few complaints have been made as to the amount or method of the settlement. Such complaints as have been received have almost invariably been due to the insured contending that he was entitled to be paid for damage due to causes other than those covered by the policy. In the specific case mentioned by the hon. member the claim included items in respect of certain walls which the assessor reported were not damaged, either directly or indirectly, by aircraft. In view of the want of agreement between Mr. Frazer and the assessor, the Aircraft Insurance Committee instructed a second assessor to give them his opinion, and he has confirmed that of the first assessor.

### Chinese Labour at Aerodromes.

MR. TYSON WILSON, on June 4th, asked the Under-Secretary of State to the

Air Ministry if he is aware that a number of Chinese labourers are being employed by certain contractors who are constructing aerodromes for his Department, that the employment of those men is causing unrest among the British workmen on those jobs, and that it is likely to lead to serious labour trouble; and will he state who is responsible for the importation of these Chinamen?

The Under-Secretary of State to the Air Ministry (Major Baird): A certain number of these labourers are at present employed on aerodrome construction. These have not been imported for the purpose, but have been recruited entirely from Chinese seamen who have come to this country as crews or part of crews of ships engaged in the importation of food and stores.

### Dropping Leaflets from Aeroplanes.

MR. TYSON WILSON, on June 5th, asked the Under-Secretary of State to the Air Ministry whether he is aware that, at a meeting of workmen, held on May 15th near the works of the Austin Company, Northfields, Birmingham, to consider a dispute between this firm and the employees, 13 aeroplanes were used to interfere with and break up the meeting and scatter leaflets; and whether he will make enquiries as to who was responsible for such action and give instructions that the use of aeroplanes and petrol in such a way is not to be countenanced?

The Under-Secretary of State to the Air Ministry (Major Baird): Aeroplanes flew over Birmingham on May 15th to drop leaflets advertising War Bonds. I have no reason to believe that their use for this purpose had any connection with the meeting referred to in the question. As I recently stated in answer to a question by the hon. member for East Edinburgh, the use of aeroplanes for dropping leaflets has now been prohibited.

MR. BILLING: Will an enquiry be made into the case referred to?

Major Baird: Enquiry is always made into questions asked by hon. members.

### Air Raids Compensation.

MR. JOWETT, on June 6th, asked the President of the Local Government Board if a widow whose late husband was killed during an enemy air raid on an English town and who has been in receipt of 12s. 6d. a week for herself and her child of eighteen months from the Prince of Wales's Fund is obliged to accept £140 in final settlement as she has been called upon to do; if he is able to state whether the amount offered is in accordance with a scale which is being generally applied, if there is such a scale; and, if so, whether he will go into the matter with the Committee concerned with a view to the scale being amended?

MR. BALDWIN: Compensation is being paid in these cases as an act of grace in pursuance of the pledge given by the Chancellor of the Exchequer in the House of Commons on June 28th last. The amount of compensation awarded is assessed in the same manner as it would be assessed if the cases fell under the Workmen's Compensation Act, 1906. If the hon. member will furnish me with sufficient detail to identify the case which he has in mind, I will enquire into the circumstances, and I will inform him of the result.



## SIDE-WINDS.

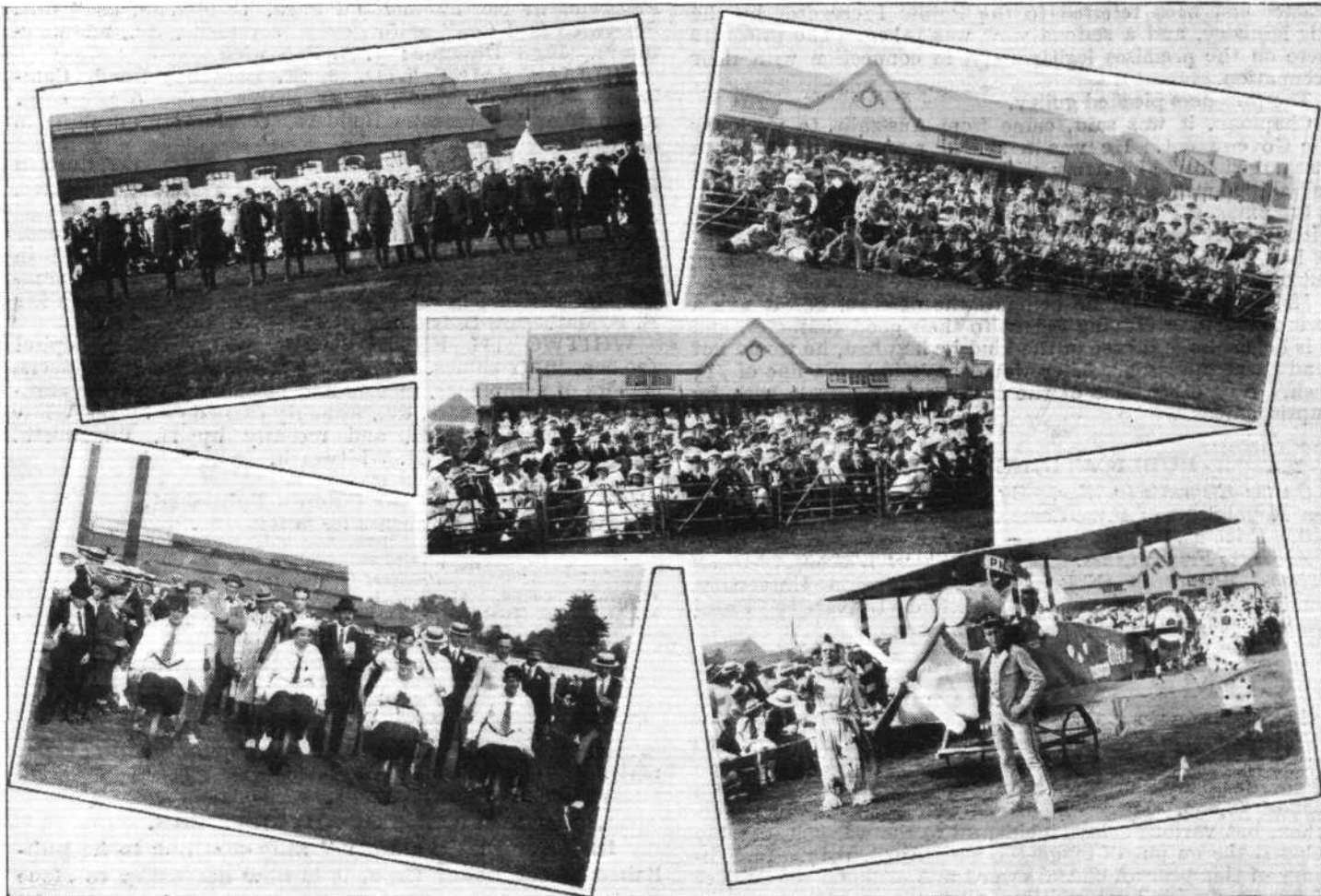
SATURDAY next, June 22nd, is the date fixed for the 3rd Annual Aircraft Workers' Sports, and, as last year, they will take place at the Stamford Bridge Grounds at Fulham, commencing at 3 p.m. The competition promises to be more keen than last year, there being 36 firms represented in the entries, as against the 20 then. Last year the Sports realised £200 for the Y.M.C.A. Fund for Disabled Sailors and Soldiers Hostels and Trade Colonies, and it is hoped that an even better result will be attained next Saturday. The sports commence at 3 p.m.

BOTH at home and abroad Rolls-Royce men are winning honours. Not only did Mr. A. Wormald, the R.R. Works Manager, figure in the list of Birthday honours as an Officer of the Order of the British Empire, but Capt. L. W. Cox, who, in the days before war alarms took him to serve with the

A.S.C. in the land of the Sphinx, was in charge of the R.R. Salesroom, was given the Military Cross.

A DEMONSTRATION of a new propeller shaping machine, which is being introduced by Messrs. A. Ransome and Co., of Newark-on-Trent, in conjunction with Mr. J. J. Kerr, evoked a good deal of interest the other day. They will be pleased to send details to anyone interested in the efficient and economical production of airscrews.

THE effective advertisement of Messrs. John Dawson and Co. (Newcastle-on-Tyne), Ltd., which has been appearing in our pages is the handiwork of the Meerloo Publicity Co., of 166, Piccadilly, W.1, who are making a speciality of aviation publicity, and can bring quite a deal of talent to bear in their efforts.



At the Humber Company's Annual Sports held at their Recreation Grounds, adjoining the works, on June 1st, when about 4,000 visitors attended and 200 wounded soldiers were entertained. The proceeds, about £200, of the sports were devoted to the Coventry and North Warwickshire Hospital. The photographs, from left to right, top: The Bandsmen's Race, Band of the R.A.F.; enclosure for wounded soldiers. Centre: In front of the pavilion. Below: Final of the Wheelbarrow Race; a home-made warplane, resulting in £1 being added to the Hospital Funds.

### Sir Arthur Pearson on Flying.

SPEAKING at the annual dinner of the Printers' Pension Corporation on June 7th, Sir Arthur Pearson said that a few days before Mr. Grahame-White took him up into the air—probably the first trip of the kind a blind man had ever made. He enjoyed the exhilarating experience of rushing through space at 80 miles an hour. Mr. Grahame-White told him that they were going to nose-dive down, and asked him not to be afraid. He did not feel anything but the most pleasurable sensation, which reminded him of skiing over vast snow slopes in the Alps in days long ago.

### Famous Austrian Wounded.

IN an aerial fight with British aeroplanes on the Trentino Front recently the Austrian airman Banfield was seriously wounded, and was removed in a dying condition to the hospital at Trieste.

### The French Aces.

THE *Matin* states that, in consequence of 2nd Lieut. Madon's thirty-second aerial victory and various victories gained by Capt. Pinsart and 2nd Lieuts. Boyeau and Bayless, the list of French "Aces" is now constituted as follows:

Fonck, 45 victories; Nungesser, 35; Madon, 32; Guerin, 22; Heurteaux, 21; Dellin, 20; Pinsart, 19; Boyeau, 14; Jailler, Bayless, Garraud and Hugues, 12 each; Tarascon, and Ortol, 11 each; Herbelin, 10.

### Under False Colours.

THE *Petit Parisien* records that in the Domremy region, on June 4th, a British aeroplane was brought down by a "Spad" machine carrying the French cockade. The close range (two lengths) and the elevation at which this happened, it is stated, made it impossible to doubt that it was a case of a German airman securing a cheap victory by using unaltered the emblems of a machine which had been captured.

### A New Star Shell.

REPORT has it that the German aviators have recently been using at night star shells of a new type. A canvas parachute is carried with an illuminating apparatus based on magnesium, which takes fire automatically between 900 and 1,200 ft. from the ground, and descends slowly, and for two minutes throws out an extremely powerful light, which lights up the ground vividly. Further information will be eagerly awaited, especially as to what justifies the "new."



## POLICE COURT PROCEEDINGS.

### Stealing "Souvenirs."

At the Clerkenwell Police Court, Albert Chapman, 36, of Rendlesham Road, Upper Clapton, and Albert Tutt, 41, of Holland Park Avenue, Kensington, aeroplane examiners, were charged, on remand, with being concerned together in stealing an aeroplane float chamber cover and needle valve, value £2, the property of His Majesty's Secretary of State for War.

Detective Bowton, N division, said he went to an enemy aircraft view-room, where he saw the prisoners, and told them he would arrest them for being concerned in stealing a float and a chamber cover and needle from a German aeroplane. The prisoners said they had not got them. On the way to the station Tutt said, "I unscrewed the valve from the machine, but did not intend to take it away." Tutt made a further voluntary statement after his finger-prints were taken.

Mr. Lewis prosecuted for the Treasury, and said the men were watched and appeared to be working together. The matter had been referred to the Public Prosecutor by the Air Ministry, and a serious view was taken. The prisoners were on the premises legitimately, in connection with their occupation.

The prisoners pleaded guilty.

Chapman, it was said, came from Australia to work for the Government. He was a skilled man. Tutt had been discharged from the Army with wounds, and was employed as a skilled man.

Chapman said it was done on the impulse of the moment without any felonious intent beyond securing a souvenir. It had been a lesson to him. Tutt said he took the thing out of the machine out of interest, and as a souvenir.

Mr. Symmons said he believed the defence, but it was a serious matter. Having regard to their good character, and this being the first case of the kind he had had, he would not send them to prison. They would have to pay a fine of £15 each. Any other case of the sort would be dealt with by imprisonment.

## PUBLICATIONS RECEIVED.

*On the Elements in War.* By Major J. Macdonald Smith, The Royal Scots (T.F.). London: Thomas Nelson and Sons, Ltd. Price 2s. 6d. net.

*Above the French Lines. Letters of Stuart Walcott, American Aviator.* Princeton, N.J., U.S.A.: Princeton University. London: Humphrey Milford, Oxford University Press, Amen Corner. Price, 4s. 6d. net.

## COMPANY MATTERS.

### Fellows Magneto Co.

THE report of the Fellows Magneto Co. for the 18 months ended December 31st last states that since the inauguration of the company the new factory has been purchased at a cost of £8,000. Large extensions were immediately undertaken, but various delays incidental to the war considerably delayed the output of magnetos until April, 1917. In February of this year an official award was made on the subject of excess profits tax, entitling all magneto manufacturers to an increased standard rate of profit in view of the importance of the industry to the country. The available profit is £8,514, after allowing £4,361 for depreciation and the writing down of preliminary expenses, &c. The directors recommend a final dividend of 5½ per cent. (less tax) on the cumulative participating preferred shares, making 9½ per cent. and a dividend of 15 per cent. (less tax) on the ordinary shares, and to carry forward £1,182.

### NEW COMPANIES REGISTERED.

**BISHOPSDOWN PROPERTY CO., LTD.**, The Spa, Tunbridge Wells.—Capital £250, in 1s. shares. Hotel, refreshment room keepers, owners or lessees of a golf course and aviation ground, &c.

**BUSH ENGINEERING CO., LTD.**—Capital £2,000, in £1 shares. Acquiring business carried on at 7, 9, and 11, Bulwer Street, Shepherd's Bush, W., by A. H. Coleman and L. Watts, as the "Bush Engineering Co.," mechanical and general engineers, automobile, aeronautical and general metal workers and manufacturers, &c. First directors: A. H. Coleman and R. L. Watts.

**CHELSEA AVIATION CO., LTD.**—Capital £250,000, in £1 shares. Acquiring business of the Wells Aviation Co. Ltd., and to enter into an agreement with S. J. Waring.

**LEWIS SPEED-UP TOOL AND ENGINEERING WORKS, LTD.**, 2A, Kelvin Road, Highbury, N. 5.—Capital £1,000, in £1 shares. Mechanical, aviation, electrical and motor, &c., engineers. First directors: J. Lazarus (British), H. Tardy (Swiss), and G. V. Thurdin (Swedish).

**MARSTON LINE, LTD.**—Capital, £40,000 in £1 shares. To enter into 2 agreements with E. C. Marston and Co., Ltd., relating to (a) the purchase of the steamship "Wirral" and (b) management, and to carry on the business of ship-owners, shipbuilders, &c. Power is specifically taken to include in the business the acquisition, building, maintenance, and repair and disposal of aircraft. Secretary: H. J. Davidson, 33, Brazennose Street, Manchester.

**NATIONAL SPRING CO., LTD.**—Capital £1,000, in £1 shares. Acquiring business of a spring manufacturer carried on by J. A. Harvey at Fountain Works, Fountain Lane, Oldbury (formerly at Spon Lane, West Bromwich), and to carry on the business of manufacturers of and dealers in accessories to hydraulic, aerostatic or general engineering &c. First directors: J. A. Harvey and W. P. Ford.

**J. A. PRESTWICH AND CO., LTD.**—Capital £200,000, in 50,000 6 per cent. cumulative preference and 149,500 ordinary shares of £1 each and 10,000 management shares of 1s. each. Acquiring the business of an engineer carried on by J. A. Prestwich at Northumberland Park, Tottenham, as "J. A. Prestwich and Co.," motor, cycle, aeroplane, &c., manufacturers. First Director: J. A. Prestwich.

**WILLIAM SAINT, LTD.**, 8, St. Barnabas Road, Cambridge.—Capital £20,000, in £1 shares (3,000 6 per cent. cumulative preference). Builders, contractors, dealers in timber, aeroplane builders, &c.

**SOUTH WALES AVIATION WORKS, LTD.**, 141, Curtain Road, E.C.—Capital £100, in 1s. shares. Permanent director, J. R. Burton.

**WALKER, MATHESON AND CO., LTD.**—Capital £1,000, in £1 shares. Acquiring business of engineers carried on in London as Walker, Matheson and Co., also aircraft and aeronautical instrument makers. First directors: J. Walker B. F. Matheson, L. E. Durrant and C. B. Boitel-Gill.

**WHITWORTH ENGINEERING CO., LTD.**—Capital £20,000, in £1 shares. Acquiring the business of engineers, makers of aeroplanes, motors and machinery used for aeroplanes and motor cars, &c., formerly carried on by the White Engineering Co., Ltd., and recently by H. Whitworth. Permanent director: H. Whitworth.

## Aeronautical Patents Published.

### Applied for in 1916.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published June 6th, 1918.

14,950. B. SCRUBY. Airships. (115,442.)

17,432. L. H. MACKAY. Mechanism for launching seaplanes from ships or land. (115,445.)

### Applied for in 1917.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published June 6th, 1918.

5,390. H. O. and A. E. SHORT. Flexible gas containers. (115,583.)

Published June 13th, 1918.

7,490. S. E. SAUNDERS. Aeroplanes. (115,704.)

16,057. A. WOLFF. Propelling means of aeroplanes. (115,768.)

## NOTICE TO ADVERTISERS.

IN order that "FLIGHT" may continue to be published at the usual time, it is now necessary to close for Press earlier. All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

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